BLM

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Environmental Assessment

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BUCKHORN AND COPPERSMITH

HERD MANAGEMENT AREAS

WILD HORSE POPULATION MANAGEMENT PLAN

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TABLE OF CONTENTS

1.0 INTRODUCTION

The Bureau of Land Management (BLM) Surprise Field Office is proposing to implement a population management operation for wild horses in order to achieve desired population levels within the Buckhorn and Coppersmith Herd Management Areas (HMAs), and from adjacent public lands outside of these designated HMAs. This would entail gathering and removing excess horses from two HMAs. Mares captured and returned to the HMAs would be treated with fertility control. The HMAs will be managed for Appropriate Management Levels. The location and boundaries of the HMAs are shown on Map 1, page 6.

Table 1. Summary of the Herd Management Areas

Herd Management Area	Public Lands within HMA (Acres)	Private Lands within HMA (Acres)	Total (Acres)
Buckhorn	76,550	9,388	85,938
Coppersmith	73,547	13,273	86,820

1.1 Summary of Proposed Action

The BLM proposes to manage wild horse populations to within the established appropriate management levels (AMLs) for two herd management areas, and to remove wild horses from certain adjacent public lands outside of these HMAs. Under this action, wild horses would be reduced in number within the two HMAs to the previously established low Appropriate Management Level (AML) in accordance with *BLM Instruction Memorandum No. 2010-135: Gather Policy, Selective Removal Criteria, and Management Considerations for Reducing Population Growth Rates.* The BLM would leave a minimum of 109 wild horses (low AML range) in the two HMAs after the Proposed Action is completed.

Current population inventories and estimates indicate that in 2012 there are approximately 247 wild horses within and adjacent to the Buckhorn and Coppersmith HMAs. Based on current estimates of the population,[1] the BLM would gather up to approximately 234 horses and permanently remove approximately 138 excess wild horses from within and outside of the two HMAs to reach the low range AML of 109 for the HMAs (see Table 1.1). An additional aerial inventory would be conducted prior to the onset of the gather to confirm numbers and locations of the animals. The results of this new information would be used to finalize the actual numbers of wild horses gathered, removed or returned to individual HMAs to achieve the objective of managing wild horse populations within the establish AML ranges.

Up to 96 of the captured wild horses would be released back to the HMAs; of these, approximately 48 would be mares treated with fertility control, and approximately 48 would be stallions. These numbers have been calculated using an estimated 95% gather efficiency for the HMAs. Applying fertility treatments to mares would help to slow wild horse population growth rates.

[1] These numbers represent the best estimates currently available and would be adjusted as necessary based on any pre-gather wild horse population inventories or specific circumstances during the gather operation.

Map 1. Buckhorn and Coppersmith HMA Boundaries and Proposed Trap and Holding Sites

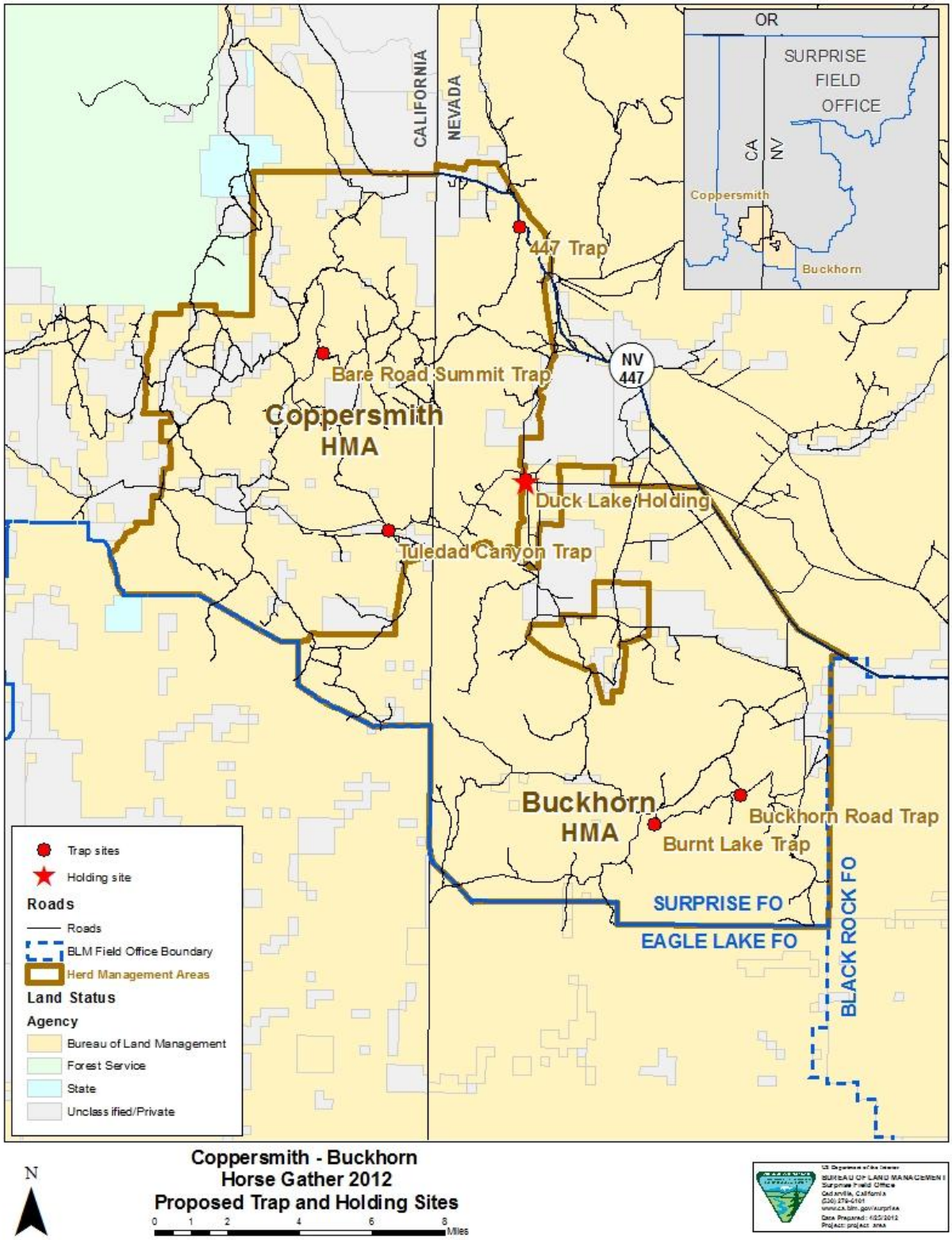


Table 1.1 Summary of Proposed Action

Herd Management Area	Wild Horse Appropriate Management Level Range (No.)	2012 Estimated Population (No.)	Planned No. to Gather[1/]	Planned No. to Remove	Planned No. of Mares Treated w/PZP	Planned No. of Stallions Returned	Minimum Post-Gather/Return Population Size
Buckhorn	59-85	172	163	113	25	25	59
Coppersmith	50-75	75	71	25	23	23	50
Total	**109-160**	**247**	**234**	**138**	**48**	**48**	**109**

[1/] The numbers in this table were calculated using an estimate of achieving a 95% gather efficiency in the two HMAs.

The gather is scheduled to take place for approximately 15 days during the fall or summer of 2012 to 2015. If at the end of this time period, wild horse populations remain above the AML range, or wild horses remain outside HMAs, additional gathers and removals would occur until the objectives are achieved. The gather operations would use a helicopter drive method of capture, with occasional helicopter assisted roping from horseback. The wild horses would be moved to temporary trap sites on the rangeland at a slow pace by helicopter, with animals moving at a walk or slow trot. At times the animals may be pushed at a faster pace as they are herded into the trap site or temporary holding corral, to keep them herded as a group. The wild horses would be gathered into capture sites constructed of portable panels, before being transported to temporary holding facilities (see Map 1). The wild horses may also be occasionally gathered by bait trapping at sites constructed with portable panels. A complete description of the Proposed Action is provided in Section 2.1.1.

1.2 Purpose and Need

The purpose of the Proposed Action is to manage populations of wild horses within the Buckhorn and Coppersmith HMAs in a manner consistent with the established AMLs, to remove wild horses from lands outside of designated HMAs that are not managed for wild horses, and to slow the current growth rate of wild horses within the HMAs. The AML is defined as the number of wild horses that can be sustained within a HMA that is consistent with achieving and maintaining a thriving natural ecological balance[2] in keeping with the multiple-use management concept for the area.

The Proposed Action is needed at this time to:

- Balance wild horse populations with other resources, including wildlife habitat, wilderness values, cultural resources, livestock grazing, and soil and vegetation resources.

[2] The Interior Board of Land Appeals (IBLA) defined the goal for managing wild horse (or burro) populations in a thriving natural ecological balance as follows: "As the court stated in Dahl v. Clark, supra at 594, the 'benchmark test' for determining the suitable number of wild horses on the public range is 'thriving ecological balance.' In the words of the conference committee which adopted this standard: 'The goal of WH&B management ***should be to maintain a thriving ecological balance between WH&B populations, wildlife, livestock and vegetation, and to protect the range from the deterioration associated with overpopulation of wild horses and burros.' " (Animal Protection Institute of America v. Nevada BLM, 109 IBLA 115, 1989).

- Bring the population size to within the AML of 109-160 horses for the two HMAs, maintain and restore a thriving ecological balance, and prevent further degradation of rangeland resources resulting from an overpopulation of wild horses.
- Reduce the impacts associated with an overpopulation of wild horses to ensure that rangeland and riparian resources are capable of meeting Land Health Standards.
- Manage wild horses within the herd management areas designated for wild horse management and extend the time before another gather would be needed to remove excess wild horses.
- Implement the requirements of Section 1333(a) of the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA).

By maintaining population size within AML, rangeland resources would be sustained and protected from the deterioration associated from wild horse overpopulation. Wild horse inventory data combined with land health evaluations indicate that current wild horse population levels are exceeding the capacity of the resources within the two HMAs to sustain this use over the long term, or to maintain a thriving ecological balance and multiple-use relationship. Resource damage is occurring, and will continue to occur, without timely action to remove excess wild horses from the HMAs.

Based upon all information available at this time, the BLM has determined that approximately 138 excess wild horses are present within and outside of the two HMAs, and need to be removed to achieve a thriving natural ecological balance. This assessment is based on the following factors including, but not limited to:

1. Population inventories and estimates indicate that in 2012 there are approximately 138 wild horses in excess of the AML lower limits for the Buckhorn and Coppersmith HMAs.
2. Wild horses are currently exceeding the amount of forage allocated to them through the established AMLs by 1.5 to 2.9 times (see Tables 1.1 and 3.3.8)
3. Riparian functional assessments completed between 2009 and 2010 document severe utilization of forage within some riparian and wetland habitats used by wild horses, and extensive trampling and trailing damage by wild horses. In the Tuledad Allotment 79% of the assessments rated riparian/wetland sites as "Functional at Risk" and 4% were rated as "Nonfunctional" due in part to the wild horse use they receive.
4. These two HMAs contain important riparian-wetland habitats for wildlife species, including greater sage-grouse, pronghorn, and mule deer, some of which are being adversely impacted by the high number of wild horses utilizing these areas.
5. The U.S. Drought Monitor showed abnormally dry conditions on portions of the two HMAs from 2009 to 2012. While 2011 was a wet year, weather patterns in the area follow a pattern of having more years of below average precipitation levels than years having above average precipitation levels. The winter of 2012 was very mild and the region is suffering due to the drought conditions. Precipitation totals in Cedarville from October 2011 through June 2012 were 70% of average.

1.2.1 Rush Wildfire

The Rush Wildfire was started by lightning on August 12, 2012 and has burned substantial acreage within the Buckhorn HMA and the adjacent Twin Peaks HMA. By August 24, 2012 the total acreage burned was 320,000 acres in Lassen County, CA and Washoe County, NV. The fire burned approximately 7,196 acres within the Buckhorn HMA and approximately 303,138 acres within the adjacent Twin Peaks HMA to the south and west.

As of August 24, 2012 there had been no documented injuries or deaths of wild horses or burros in either HMA due to the Rush Fire. BLM observers on the ground and in the air have verified that the horses and burros have moved to higher ground within these HMAs, which is where they are usually located this time of year. In some areas, wild horses have come down off the mountains to lowland areas where water and forage is still available in limited quantities.

The BLM has directed that all gates be left open during and after the course of the wildfire to allow wild horses and burros free passage within and between the affected HMAs. Due to the severity of this fire, there is a possibility that the horses within these HMAs will have to be gathered earlier than the proposed timeframe of November 2012. This is yet to be determined, as the extent of damage and remaining forage and water cannot be determined until the fire is 100% contained. After wildland fire operations are complete BLM Specialists will complete an aerial inventory of the HMA to determine how many horses are located in specific areas of the HMA, and to document the quantity of forage and water in these areas. A full analysis will be completed at this point to determine the course of action to be taken.

1.3 Objectives

The following objectives were developed for the Proposed Action in accordance with the Surprise Resource Management Plan (RMP), land health standards and guidelines, and previous multiple use decisions for these two HMAs:

Objective 1: Manage wild horses within established appropriate management level ranges to achieve a thriving ecological balance.

Objective 2: Implement methods to slow the reproductive rate of wild horses within HMAs.

Objective 3: Provide a sustainable level of forage and habitat for wild horses that is consistent with achieving BLM land health standards, objectives for other resources, and multiple-use management of public lands.

Objective 4: Reduce the amount of future disturbance to wild horses from multiple gather operations.

Objective 5: Maintain riparian areas in "Proper Functioning Condition" (PFC). Improve riparian areas and springs that are not in PFC, and are being affected by wild horse grazing, through population management of wild horses.

Objective 6: Protect, maintain and enhance upland and riparian vegetation for wildlife habitat, including that for greater sage-grouse, pronghorn, mule deer, and other game and non-game species.

Objective 7: Manage wild horses in a manner which promotes economic development and tourism.

Objective 8: Maintain type, color, size, and confirmation of wild horses according to historical characteristics of animals resident in the two Herd Management Areas.

1.4 Decision to be Made

Upon completion of the environmental assessment, the authorized officer will determine whether or not to implement the proposed wild horse gather and population management measures in order to achieve and maintain the established AMLs for the two HMAs, remove horses from public lands not allocated for wild horse use, and to prevent further deterioration of the rangeland resulting from the current over-population of wild horses, as documented through monitoring. The decision would include details of how the gather would be carried out, along with design criteria and standard operating procedures for the gather and fertility control operations.

The decision resulting from this environmental assessment would not set or adjust appropriate management levels, which are deemed to still be the appropriate levels for the two HMAs. The decision would not change herd management area boundaries, or establish other designations, which are land use plan decisions. The decision would not revise authorized livestock grazing permits, as these decisions are made by evaluating each individual grazing allotment and associated permits.

1.5 Wild Horse Herd Management Areas

Buckhorn Herd Management Area

The Buckhorn HMA has an eastern boundary at Nevada Highway No. 447 in Duck Flat Valley (elevation of 4,700 feet), located in Washoe County, Nevada and extends west to the Cottonwood Mountains (elevation of 7,240 feet) in Lassen County California, as shown on Map 1. The HMA contains approximately 76,550 acres of public lands and 9,388 acres of private lands. Some of this private land is fenced, but also includes unfenced and intermingled private land parcels varying in size from 40 acres to over 640 acres. The adjoining HMAs include the Twin Peaks HMA, which is located to the south of the Buckhorn HMA. The Surprise/Eagle Lake Field Office division fence separates these two HMAs. The Buckhorn HMA is adjacent to the Coppersmith HMA. Tuledad Canyon and a pasture division fence within the Tuledad Allotment is the boundary between these two HMAs.

The *Wild Horse Gather and Removal Plan* Decision of November 1995, (Environmental Assessment #CA-370-95-08) established the Appropriate Management Level (AML) at 59-85 wild horses in the Buckhorn HMA and 50-75 wild horses in the Coppersmith HMA. The AMLs were established using monitoring and resource data collected on the HMAs from 1987 to 1995.

The Buckhorn HMA was last gathered in 2009, and a total of 193 horses were removed. The last aerial census for the Buckhorn HMA was conducted in July 2010, and a total of 129 wild horses were counted. The current estimated population of 172 horses is based on a 20% annual

recruitment rate since 2010 (year of last inventory). The AML for this HMA is 59 to 85 wild horses.

Coppersmith Herd Management Area

The Coppersmith HMA is located in Lassen County, California and Washoe County, Nevada from Duck Lake, and NV Highway 447, west to lower slopes of the Warner Mountains, as shown on attached Map 1. The HMA consists of approximately 73,547 acres of public lands and 13,273 of other lands, which are mostly private. Elevations range from 4,700 feet on Duck Lake to 8,000 feet on the south end of the Warner Mountains.

The Coppersmith HMA was last gathered in 2009, and a total of 247 horses were removed. The last aerial census for the Coppersmith HMA was conducted in July 2010, and a total of 53 wild horses were counted. The current estimated population of 75 horses is based on a 20% annual recruitment rate since 2010. The AML for this HMA is 50 to 75 wild horses.

The Buckhorn and Coppersmith Herd Management Area Plans (HMAP) were completed in 1984 and revised in 1989. These plans provide management parameters on such variables as wild horse conformation, color of animal to be managed, and sex and age structure.

The HMAPs Objectives include:

1. Maintain healthy, self-sustaining wild and free-roaming horse herds.
2. Strive to achieve 100% adoptability of all horses that are removed from the herds through the regular adoption program.
3. Prevent inbreeding problems from occurring in the HMAs.

Current Appropriate Management Levels

Table 1.5.1 Initial and Current Appropriate Management Levels for the two HMAs

HMA	Appropriate Management Level (Numbers)		
	Management Framework Plans, 1979-1983	Herd Management Area Plans, 1989	Environmental Assessments; Resource Management Plan, 2008
Buckhorn	100 - Combined with Coppersmith	50-75	59-85
Coppersmith	100 - Combined with Buckhorn	50-75	50-75
Total	100	100-150	109-160

The AMLs for the two HMAs were formally adopted from their respective environmental assessments in the Surprise RMP and Record of Decision which was issued in April 2008. The combined appropriate management level for the two HMAs has been established as a population range of 109-160 wild horses (Table 1.5.1). The Surprise RMP re-affirmed the AML levels that were previously established through inventory and monitoring data. The BLM chooses to

establish the AML as a population range, which allows for the periodic removal of excess animals (to the low range) and subsequent population growth (to the high range) between removals (gathers).

The AMLs have been established, based on available data, at a level that will ensure a thriving natural ecological balance and multiple-use relationship within the HMAs. The BLM strives to manage wild horses at the established AMLs, and removes animals when the population exceeds the established AML range. It is very important to maintain the populations within the established AML ranges in order to prevent the overuse and degradation of rangeland resources, and to promote improved wild horse habitat condition and population health. After removal of the excess wild horses, periodic monitoring of wild horse use throughout the HMAs will continue, which includes collecting information on wild horse distribution, animal inventory and condition, vegetative trend, forage utilization, water availability, and riparian/wetland conditions.

The BLM's determination of excess wild horses is based on the establishment of AMLs through prior decision making processes, combined with evaluations of resource conditions, and population monitoring in relation to use by wild horses, and other uses, including livestock grazing permits for cattle and sheep (see Table 1.5.2).

Buckhorn HMA Appropriate Management Levels

The AML for the Buckhorn HMA was increased from a population range of 50-75 wild horses to 59-85 wild horses in November 1995. The AML increase was supported by livestock utilization data, actual use information, wild horse population inventory data, riparian utilization monitoring data collected from 1992, 1993, and 1994 in areas that received primarily wild horse use, and condition of the wild horses and their winter habitat during the winter of 1992-1993 when there was above average snowfall. The 2008 Surprise RMP re-affirmed this AML range, as there was no data that showed further adjustments were appropriate or necessary.

Table 1.5.2 Current Appropriate Management Levels for the two HMAs

HMA	BLM Environmental Documents/Date	Appropriate Management Level (Numbers)	Forage Allocation (AUMs)[1/]
		Horses	Horses[2/]
Buckhorn	Surprise RMP/ROD, April 2008; Environmental Assessment # CA-028-95-08. Buckhorn and Coppersmith Herd Management Area Gather – FY 1996, November 1995	59-85	708-1,020
Coppersmith	Surprise RMP/ROD, April 2008; Environmental Assessment # CA-028-95-08. Buckhorn and Coppersmith Herd Management Area Gather – FY 1996, November 1995	50-75	600-900
Total		109-160	1,308-1,920

[1/] Animal Unit Months (AUM) are defined as the amount of forage necessary for the sustenance of one horse or cow or its equivalent for a period of 1 month.

[2/] Horse AUMs are calculated using one mature horse (with foal) as 1 animal unit equivalent, for a 12 month grazing period.

Coppersmith HMA Appropriate Management Levels

The AML for the Coppersmith HMA was reaffirmed as a population range of 50-75 wild horses in November 1995. The AML was supported by livestock utilization data, actual use information, wild horse population inventory data, riparian utilization monitoring data collected from 1992, 1993, and 1994 in areas that received primarily wild horse use, and condition of the wild horses and their winter habitat during the winter of 1992-1993 when there was above average snowfall. The 2008 Surprise RMP re-affirmed this AML range, as there was no data that showed further adjustments were appropriate or necessary.

Adjacent Lands Outside of HMAs

The public land portions adjacent to these two HMAs are areas that did not have wild horses at the time of passage of the *Wild Free-Roaming Horses and Burros Act of 1971* (as amended), or that have been determined through the BLM Land Use Planning process to not be suitable for wild horse use. As such, the areas are not managed for wild horses and applicable laws, policies, regulations, and land use plans direct that any wild horses found on these lands should be promptly removed.

1.6 Land Use Plan Conformance

The proposed action is in conformance with the Surprise Resource Management Plan (RMP)/Record of Decision (ROD), April 2008, Sections 2.21.5, which states:

> Gathers and (increasingly) fertility control would be used to maintain herds within AMLs. Forage allocation for wild horses and livestock would be managed equitably (i.e. neither having precedence over the other). If monitoring reveals adverse impacts from wild horses or livestock, adjustments would be made to the specific class of use (i.e., to wild horses *or* livestock). In the absence of class-specific monitoring data, stocking rates (active livestock AUMs and wild horse AMLs) would be proportionately reduced.
>
> During gathers, wild horses would be selected for type, conformation, size, and color according to historical herd characteristics for each HMA. Aerial census of wild horses will be conducted in each HMA at least every third year. Wild horses will be gathered every three-to-four years in order to maintain appropriate management levels. Animals that are found outside of designated HMAs will be removed. Genetic data from each herd (during gathers) will be collected for establishing baseline information. Fertility control will be used in some or all HMAs (as funding and other constraints allow) to assist in maintaining AMLs.
>
> Fence building will be minimized and unnecessary fencing eliminated where this prevents seasonal movement within an HMA.

1.7 Relationship to Laws, Regulations, and Other Plans

The Proposed Action is in conformance with the *Wild Free-Roaming Horses and Burros Act of 1971* (as amended), applicable regulations at 43 CFR § 4700 and BLM policies. Included are:

43 CFR § 4710.4 Constraints on management: Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management shall be at the minimum feasible level necessary to attain the objectives identified in approved land use plans and herd management area plans.

43 CFR § 4720.1 Removal of excess animals from public lands: Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exists, the authorized officer shall remove the excess animals immediately.

43 CFR § 4740.1 Use of motor vehicles or aircraft:

Motor vehicles and aircraft may be used by the authorized officer in all phases of the administration of the Act, except that no motor vehicle or aircraft, other than helicopters, shall be used for the purpose of herding or chasing wild horses or burros for capture or destruction. All such use shall be conducted in a humane manner.

a) Before using helicopters or motor vehicles in the management of wild horses or burros, the authorized officer shall conduct a public hearing in the area where such use is to be made.

Wilderness Law, Regulation, and Policy

The Proposed Action is in conformance with the *Interim Management Policy for Lands under Wilderness Review*, BLM H-8550-1, (July 1995b), Chapter IIIE, Wild Horse and Burro Management, and with other BLM decisions for management of multiple use resources on public lands within this area.

Environmental Assessments, other BLM Documents

The following documents contain information from prior NEPA analyses to which this EA is tiered, and BLM decisions related to land health assessments, wild horses, and other resources within the Buckhorn and Coppersmith HMAs:

1. BLM Environmental Assessment # DOI-BLM-CA-N070-2009-011. *Buckhorn, Coppersmith, and Carter Reservoir Wild Horse Herd Management Areas Capture and Remove P*lan, August, 2009.
2. *Surprise Resource Management Plan*, April, 2008
3. BLM Environmental Assessment # CA-370-03-27. *Buckhorn and Coppersmith Wild Horse Herd Management Area Capture Plan*, November, 2003.
4. BLM Environmental Assessment # CA-370-97-22. *Coppersmith and Buckhorn HMA – Removal of Excess Wild Horses to AML*, October, 1997
5. BLM Environmental Assessment # CA-028-95-08. *Buckhorn and Coppersmith Herd Management Area Gather – FY 1996*, November, 1995.

6. BLM Environmental Assessment # CA-028-89-12. *Surprise Resource Area Wild Horse Removal*, September, 1989
7. BLM *Coppersmith Herd Management Area Plan*. CA-261, 1989
8. BLM *Buckhorn Herd Management Area Plan*. CA-262, 1989
9. BLM Land Use Plan, *Tuledad/Homecamp Management Framework Plan*, 1979.

1.8 Conformance with Rangeland Health Standards and Guidelines

The Surprise Resource Management Plan (RMP) and Record of Decision of April 2008 adopted the Northeastern California and Northwestern Nevada, Standards for Rangeland (Land) Health and Guidelines for Livestock Grazing Management of July 2000.

Land health assessment and determination was completed on the Tuledad allotment in 1999 (which includes the Buckhorn and Coppersmith HMAs) to determine conformance with Rangeland Health Standards. This assessment information from the 1990's indicated that the soils, riparian/wetland, and biodiversity standards were being met, and the stream health standard was not being met. However, riparian functional assessment information collected between 2007 indicates that riparian resources were impacted by excessive utilization and trampling by livestock and wild horses. Higher elevations areas in the allotment lack the desired vegetation composition, and many are being impacted by juniper encroachment.
The Proposed Action, and gather alternatives are consistent with making significant progress towards meeting Rangeland Health Standards.

1.9 Scope of This Environmental Analysis / Identification of Issues

1.9.1 History of the Planning and Scoping Process

The BLM began internal scoping for the Buckhorn and Coppersmith HMA gather plans in May 2012. A public scoping letter was sent by the BLM on April 23, 2012 to approximately 50 members of the interested public, was posted on the BLM's external web sites, and published in local newspapers. The public notification provided a summary of the Proposed Action and provided a 30-day period for public scoping comments.

Scoping letters or emails were received from approximately 46 individuals or groups. The following relevant issues were identified as a result of consultation/coordination and internal and external scoping relative to BLM's management of wild horses in these two HMAs:

1. A need to implement population control methods in order to maintain population size within the established AML range over the long-term.
2. Impacts to vegetation and soils, riparian/wetland sites, and cultural resources.
3. Impacts to native wildlife, migratory birds, and threatened, endangered and special status species and their habitat.
4. Impacts to individual wild horses and herds.

The scope of this environmental assessment is limited to the need to manage the two HMAs for a thriving ecological balance by removing excess wild horses, and implementing fertility control to mares in order to slow annual growth rates. Some scoping comments received from the public are outside the scope of this EA and hence are not listed as issues for this analysis.

The BLM has discussed and analyzed all of the issues listed above and those listed in Table 1.9.2 as "May Impact" within this EA. Section 2.3 provides an explanation of why some concerns raised through public scoping have not been analyzed.

1.9.2 Resource Issues/ Supplemental Authorities

The following resources have been evaluated to determine if they are resource issues that may be impacted by the Proposed Action. All resources that are rated as "May Impact" are discussed and analyzed in Section 3.0 Affected Environment and Section 4.0 Environmental Consequences.

Table 1.9.2 Resource Issues/ Supplemental Authorities

Critical Element	No Impact	May Impact	Not Present	Rationale
Air Quality/Global Climate Change	X			The planning area is outside an air quality non-attainment area. Implementation of the Proposed Action would result in small and temporary areas of disturbance to greenhouse gas emissions.
Area of Critical Environmental Concern			X	This element is not present within or near the area determined to be influenced by the proposed action.
Cultural Resources		X		These HMAs contain abundant cultural resources; many are associated with riparian areas. See Section 3.4.
Environmental Justice	X			The activities inherent to the proposed action are not of the nature and scope that would affect this element.
Farmlands, Prime or Unique			X	This element is not present within or near the area determined to be influenced by the proposed action.
Floodplains			X	This element is not present within or near the area determined to be influenced by the proposed action.
Livestock Grazing		X		The Tuledad livestock grazing allotment overlaps with the HMAs. See Section 3.5.
Migratory Birds		X		See Section 3.12.
Native Wildlife Habitat		X		Some riparian sites and springs which are important habitat for wildlife species are being impacted by an excess number of wild horses. See Section 3.12.
Noxious Weed Species		X		Noxious weed species are present in the HMA. See Section 3.6.
Native American Religious Concerns	X			Consultation and Field Tours of the project area will be conducted with local tribes if requested.
Public Health/ Safety	X			Public observation of the gather activities would be allowed, subject to observation protocols intended to minimize potential for harm to members of the public.

Critical Element	No Impact	May Impact	Not Present	Rationale
Soil Resources		X		Soil resources would be impacted at temporary gathering and holding sites. See Section 3.8.
T&E Fauna/Flora			X	No federally listed threatened or endangered (T&E) wildlife species or habitats are known to occur within the project area. See Sections 3.9 and 3.12.
Upland Vegetation		X		Upland vegetation would be impacted at temporary gathering and holding sites. See Section 3.10.
Waste - Hazardous			X	This element is not present within or near the area determined to be influenced by the proposed action.
Water Availability		X		These two HMAs have many available drinking water sites; however many of these sites become dry in years of drought. See Section 3.2.
Water Quality - Surface	X			The activities inherent to the proposed action are not of the nature and scope that would affect this element.
Wetlands/Riparian		X		The two HMAs contain several wetlands and riparian areas, many of which are showing degrading conditions. See Section 3.7.
Wild Horses		X		Wild horses would be impacted by the Proposed Action. See Section 3.3.
Wild & Scenic Rivers			X	This element is not present within or near the area determined to be influenced by the proposed action.
Wilderness Study Areas		X		The Buckhorn HMA includes portions of one wilderness study area. See Section 3.11.
Wilderness Character	X			See Section 3.11.

2.0 ALTERNATIVES

This section describes the Proposed Action Alternative, the No Action Alternative, and two alternative methods of implementing the wild horse gather operation. This section also discusses ten additional alternatives that were proposed through scoping, and have been considered by the BLM, but were eliminated from detailed analysis. Alternatives analyzed in detail include the following:

Alternative A. (Proposed Action): ***Manage Wild Horse Populations to Achieve Low AML; Return Gathered Non-Excess Horses To HMAs; Apply Fertility Control to Mares***

Alternative B. ***Manage Wild Horse Populations to Achieve Low AML; Return Gathered Non-Excess Horses To HMAs***

Alternative C. ***Gather up to 95% of Wild Horses in the HMAs; Return All Gathered Horses after Applying Fertility Control to Mares***

Alternative D. (No Action Alternative): ***Do Not Gather or Remove Excess Wild Horses***

Table 2.1 below provides a summary of management actions for each alternative.

Table 2.1 Summary of Alternatives

Action	Alternative A. Proposed Action	Alternative B. Removal	Alternative C. Fertility Control	Alternative D. No Action
	Number of Wild Horses			
Total Horses Gathered from HMAs	**234**	**234**	**234**	**0**
Total Horses Removed from HMAs	**138**	**138**	**0**	**0**
Mares Treated With Fertility Control and Returned To HMAs	48	0	117	0
Stallions Returned To HMAs	48	48	117	0
Untreated Mares Returned to HMAs	0	48	0	0
Total Returned to HMAs	**96**	**96**	**234**	**0**
Post-Gather Horses Remaining In HMAs	109	109	247	247
Post-Gather Sex Ratio	50% mares/ 50% stallions	50% mares/ 50% stallions	50% mares/ 50% stallions	50% mares/ 50% stallions

The terms listed below have been defined to clarify the language of the alternatives:

Gather: the action of capturing horses into a trap or holding corral, and collecting appropriate information on them, such as the location collected, sex, age, condition, etc.

Removal: the action of permanently removing horses from an HMA after they are gathered, and preparing them for adoption, sale or long-term pasture.

Return or Release: the action of returning horses to the HMA after they are captured and recorded, and in some cases, treated with fertility control.

2.1 Description of Alternatives

2.1.1 Alternative A. (Proposed Action): Manage Wild Horse Populations to Achieve Low AML; Return Gathered Non-Excess Horses to HMAs; Apply Fertility Control to Mares

The Bureau of Land Management (BLM) Surprise Field Office is proposing to implement a population management operation for wild horses in order to attain the low end of AML by removing excess animals from the Buckhorn and Coppersmith Herd Management Areas (HMAs) and removing all animals from adjacent public lands outside of the designated HMAs.

The Proposed Action would return wild horse populations to within the established AML of 109-160 animals. Based on current estimates of the population[3], the BLM would gather up to approximately 234 wild horses and permanently remove approximately 138 excess wild horses from within and outside these two HMAs (see Table 1.1). Up to 96 of the captured wild horses would be released back to the HMAs; of these, approximately 48 would be mares treated with fertility control, and approximately 48 would be stallions. These numbers have been calculated using an estimated 95% gather efficiency from four HMAs. Applying fertility control treatments to mares would be used to slow population growth rates.

The gather is scheduled to take place for approximately 15 days during the fall or summer of 2012 to 2015. The gather is planned for these time periods due to several logistical and environmental constraints. In 2012 severe drought and several wildfires within HMAs located in California and Nevada have resulted in the need for several emergency gathers to be scheduled to protect wild horses and their habitat. Factors that will affect the gather schedule include coordination with the BLM National Gather Schedule, availability of the gather contractor, condition of roads needed to access capture sites and temporary holding facilities, weather conditions, and health concerns of both adult animals and foals.

Several important factors could result in adjustments to the schedule, including impacts from the Rush Wildfire (August 2012), animal condition, herd health, weather conditions, or other considerations. If at the end of this time period, wild horse populations remain above the AML range or wild horses remain outside HMAs, additional gathers and removals would occur until the objectives are achieved. If the gather is postponed, a new pre-gather inventory would be conducted, and the numbers for gathering and removal of wild horses would be adjusted as necessary to achieve low end AML and population control objectives.

If gather efficiencies do not allow for the attainment of the Proposed Action during the 15 day gather period, the BLM would return to the HMAs to complete the Proposed Action by removing or treating any additional wild horses necessary to achieve the low range of AML, and to implement fertility control treatments (PZP-22) to mares remaining in the HMAs. Any follow-up gather activities would be conducted in a manner consistent with those described for the winter 2012 gather. Funding limitations and competing priorities may further delay a follow-up gather and the completion of the population control component of the Proposed Action.

[3] These numbers represent the best estimates currently available and would be adjusted as necessary based on any pre-gather wild horse population inventories or specific circumstances during the gather operation.

During the gather period, mares selected for fertility control would be treated by the BLM at the temporary holding facilities, and released back to the HMA at the location where they were captured. It may be necessary to hold studs and treated mares at the temporary holding facilities for a period of up to 16 days, or for the duration of gather, to achieve the desired post-gather on the range population number, age structure, and sex ratio. Studs selected for release to an HMA would also be released at the location where they were captured. Excess wild horses would be transported to a designated BLM short-term holding corral facility, such as Litchfield, CA or Palomino Valley near Sparks, NV. These excess wild horses would be vaccinated, freeze-marked, and prepared for the adoption program or for sale to qualified individuals or for long-term (grassland) pastures. Preparing wild horses takes a minimum of 30 days, but this could be much longer for mares with young foals; "heavy" mares that are nearing foaling would not be shipped for some time.

The gather operations would use a helicopter drive method of capture, with occasional helicopter assisted roping from horseback. The horses would be moved to temporary trap sites on the rangeland at a slow pace by helicopter, with animals moving at a walk or slow trot. At times the animals may be pushed at a faster pace as they are herded into the trap site or temporary holding corral, to keep them herded as a group. The horses would be gathered into capture sites constructed of portable panels, before being transported to temporary holding facilities (see Map 1). The horses may also be occasionally gathered by bait trapping at sites constructed with portable panels.

Based upon all information available at this time, the BLM has determined that approximately 138 excess wild horses are present within and outside of the two HMAs, and need to be removed to achieve a thriving natural ecological balance. This assessment is based on the following factors including, but not limited to:

1. Population inventories and estimates indicate that in 2012 there are approximately 138 wild horses in excess of the AML lower limits for the Buckhorn and Coppersmith HMAs.
2. Wild horses are currently exceeding the amount of forage allocated to them through the established AMLs by 1.5 to 2.9 times (see Tables 1.1 and 3.3.8)
3. Riparian functional assessments completed between 2009 and 2010 document severe utilization of forage within some riparian and wetland habitats used by wild horses, and extensive trampling and trailing damage by wild horses. In the Tuledad Allotment 79% of the assessments rated riparian/wetland sites as "Functional at Risk" and 4% were rated as "Nonfunctional" due in part to the wild horse use they receive.
4. These two HMAs contain important riparian-wetland habitats for wildlife species, including greater sage-grouse, pronghorn, and mule deer, some of which are being adversely impacted by the high number of wild horses utilizing these areas.
5. The U.S. Drought Monitor showed abnormally dry conditions on portions of the two HMAs from 2009 to 2012. While 2011 was a wet year, weather patterns in the area follow a pattern of having more years of below average precipitation levels than years having above average precipitation levels. The winter of 2012 was very mild and the region is suffering due to the drought conditions. Precipitation totals in Cedarville from October 2011 through June 2012 were 70% of average.

Gather operations would be conducted in accordance with the Standard Operating Procedures (SOPs) described in the National Wild Horse Gather Contract. See Appendix A for SOPs and additional information on capture methods, traps and holding facilities, motorized equipment, safety and communications, and public participation.

Fertility Control of Wild Horses

The Proposed Action would include application of a two-year Porcine Zona Pellucida (PZP-22), or similar, vaccine to approximately 48 wild horse mares in the Buckhorn and Coppersmith HMAs before releasing them back to the range in order to decrease annual population growth. In order for the fertility control of mares to be most effective, the gather operation would need to result in the capture of at least 90-95% of the entire current wild horse population in the HMAs. Immuno-contraceptive treatments would be conducted in accordance with the approved standard operating procedures and with BLM Washington Office Instruction Memorandum 2009-074 (see *Fertility Control Standard Operating Procedures,* Appendix B).

The actual number of mares returned and treated with immuno-contraceptive to the individual HMAs would be based on the actual numbers of mares gathered, and pre- and post-gather population inventories. All treated mares would be freeze marked on the left hip to identify animals for data collection. Post-gather monitoring would include helicopter flights to locate treated mares to determine efficacy of the treatment. Long term monitoring would determine when mares have returned to fertility.

Potential Limitations to Fertility Control Options for Wild Horses

Due to the mountainous terrain, vegetative cover, and unpredictable wild horse movements, the efficiency of the gather operation may be less than optimal. At a gather efficiency rate below 90%, an insufficient number of wild horses would be gathered to implement fertility control, or to allow the release of wild horses back onto the range, or to achieve the low AML range. If less than 90% of the herd is captured, fertility control treatments of mares would not be implemented, and the Proposed Action would consist of the following actions for wild horses: 1) gather and removal to achieve the low AML, and 2) conduct follow-up gather activities for the next five years.

Provisions for Horse Health and Safety

The timing of the gather operations would be in late fall to winter. Although not usually a concern for winter operations, the BLM and contractor will follow guidelines to prevent overheating stress to the wild horses based on terrain, physical barriers, weather, condition of the animals, and other factors (see Appendix A). Most of the foals would be over 5 months in age, and would be ready for weaning from their mothers. If and when daytime temperatures reach a point where heat stress is determined to be a risk factor to the animals, gather operations would be held during the cooler parts of the day, such as during the early morning hours. Electrolytes would be administered to the drinking water during the gather, if weather and condition of the animals deems this necessary, to ensure animal health.

Additionally, BLM staff maintains supplies of electrolyte paste if needed to directly administer to an affected animal.

Removal of Excess Horses

As per The Wild Free-Roaming Horses and Burro Act of 1971, Section 1333(2)(iv)(A), the BLM would remove excess wild horses during the gather operation as follows:

A. The Secretary shall order old, sick, or lame animals to be destroyed in the most humane manner possible.

B. The Secretary shall cause such number of additional excess wild free-roaming horses and burros to be humanely captured and removed for private maintenance and care for which he determines an adoption demand exists by qualified individuals, and for which he determines he can assure humane treatment and care… Provided that, not more than four animals may be adopted per year by any individual unless the Secretary determines in writing that such individual is capable of humanely caring for more than four animals, including the transportation of such animals by the adopting party.

C. The Secretary shall cause such number of additional excess wild free-roaming horses and burros for which an adoption demand by qualified individuals does not exist to be destroyed in the most humane and cost efficient manner possible.

The BLM would implement (A) in the following manner: Prior to the gather and once the gather operations begin, sick or lame animals will be identified as they are seen, and actions would be taken to diagnose the extent of the injury. If an animal is obviously lame with a broken bone or other ailment, the animal will be euthanized on the range. If the qualified veterinarian or BLM staff member make a determination that the animal may have a chance of recovery, that animal will be either a) not gathered with the rest of the herd, and undergo a closer field inspection, or b) gathered with the rest of the herd and closely examined up-close in the trap site. It is usually necessary to capture the animal so that BLM can examine it up close to make a determination as to whether the animal should be humanely euthanized or otherwise treated and cared for. Every effort will be made to allow the animal a chance to recover, if that is feasible. The BLM considers this the most humane way to evaluate, and if need be, destroy old, sick, or lame animals. See Section 2.2.3 for additional information.

Previous recent BLM gathers in northeast California and northwest Nevada have shown that only a very small percentage of the overall population of wild horses are old, sick or lame animals that require humane euthanasia. The anticipated number of animals for these HMAs that would fall into this category and be euthanized would likely be less than 1% of gathered horses.

Because the Proposed Action requires gathering more than just the excess horses to be removed from the range, the BLM would implement (B) and (C) in the following manner: After being gathered, animals would be selected for removal from or release back to the HMA using a selective removal strategy by age class, to the extent possible, in the following order. All horses removed would be placed into the national adoption program, or moved to long term pasture.

1) Age Class – Four Years and Younger: These horses are the first priority for removal and placement into the national adoption program.

2) Age Class – Eleven To Nineteen Years Old: These horses should be removed only if

management goals cannot be reached by removing horses four years and younger, or if specific exemptions prevent them from being returned to the range.

3) Age Class – Five To Ten Years Old: These animals would be removed only if management goals cannot be reached by removing horses from categories 1 and 2 above.

4) Age Class – Twenty and Older: These horses would not be removed from the HMA, unless specific exemptions prevent them from being returned to the range. This age group can typically survive on the HMA but may have difficulty adapting to captivity, and the stress of handling and shipping.

All wild horses returned to the HMAs would be freeze marked to help track future distribution patterns and movements. The mares and studs to be returned to the herd would be selected to maintain a diverse age structure, specific herd characteristics, and conformation (body type) as identified in the *Herd Management Area Plans*. Post-gather, every effort would be made to return released wild horses to the same general area from which they were gathered.

Recording of Herd Characteristics

Herd characteristic data would be recorded for all animals, including sex and age distribution, reproduction capability, body condition class (using the Henneke rating system), color, size, and disposition of that animal.

Genetic Diversity

The BLM has determined in prior decisions that maintaining wild horses within the established AML range will allow for sufficient genetic diversity. Hair samples will be collected to establish genetic baseline data, as outlined in Washington Office Instruction Memorandum 2009-062 *Wild Horse and Burro Genetic Baseline Sampling*. Genetic material will be collected for all HMAs gathered. Once a baseline is established, additional samples would be collected to reassess genetic diversity every other gather (e.g. every 6-10 years). If initial testing indicates diversity is less than desired, the herd should be reassessed more frequently (e.g. every gather).

Equine Specialist/Veterinarian

A licensed veterinarian would be on site for the duration of the gather to examine animals, and make recommendations to BLM for care and treatment of wild horses, and to ensure humane treatment. This person would be a BLM contract veterinarian, Animal and Plant Health Inspection Service (APHIS) Veterinarian, or other licensed veterinarian. BLM staff would be present on the gather at all times to observe animal condition, and to ensure humane treatment. Animals which are transported to BLM holding facilities are inspected by facility staff and by an on-site contract veterinarian to observe animal health, and to ensure that the animals have been cared for humanely.

Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy (Washington Office Instruction Memorandum 2009-041). Conditions requiring humane euthanasia occur infrequently and are described in more detail in Section 4.2.3.

Trap Sites and Holding Facilities

The BLM has identified five potential capture sites that could be used for the gather (see Map 1). Trap sites would consist of portable gates, corrals, and chutes needed to hold and care for the animals temporarily, and to record information on the animals captured. The trap sites would be approximately 3 acres in size, and would be used for a total of 1 to 10 days. The BLM may also use one temporary holding facility, about 5 acres in size, to assist with sorting and transporting animals. These holding sites would be utilized for 1 to 15 days.

Trap sites and holding facilities would be inventoried for cultural and botanical resources, and noxious weeds prior to use. A wildlife and BLM sensitive species and cultural resource surveys will be completed prior to use of trap sites. If cultural resources or special status plants are encountered, these locations would not be utilized unless they could be modified to avoid impacts to these resources. Noxious weed inventories would be conducted at the proposed trap or holding facilities, and along access roads prior to use. If priority weed infestations are identified within these locations, these areas would be treated, and monitored prior to and following the gather, to reduce noxious weed transport from the site. If any BLM sensitive species or cultural resources are detected at a trap site, the site would not be utilized unless the site location could be modified to avoid impacts to the species.

Temporary Holding Facilities during Gathers

Wild horses gathered would be transported from the trap sites to a temporary holding corral within the HMA in goose-neck trailers. At the temporary holding corral the animals will be sorted into different pens based on sex. The wild horses will be aged and fed good quality hay and water. Wild horses selected for return to the HMAs after the application of fertility control and/or near the end of the gather operation will be kept in pens separate from wild horses that will be removed. Mares and their un-weaned foals will be kept in pens together.

Post-gather Inventory

The BLM would conduct a comprehensive post-gather aerial population inventory to determine the number of wild horses remaining within the HMA.

Gather Operations in Wilderness Study Areas

Gather operations in Wilderness Study Areas (WSA) would be conducted in accordance with the *Interim Management Policy for Lands under Wilderness Review*, BLM H-8550-1, (July 1995b), Chapter IIIE, Wild Horse and Burro Management (Wilderness IMP). Gather operations would consist of herding the animals by helicopter (or on horseback) to temporary corrals, generally located outside of WSA boundary. No landing of aircraft would occur in a WSA, except for emergency purposes. No motorized vehicles would be used in a WSA in association with the gather operation, unless such use is consistent with the minimum requirements for management of WSAs, and is preapproved by the authorized officer.

The Wilderness IMP allows for temporary facilities for the management of wild horses to be installed within WSAs if they satisfy the non-impairment criteria, which requires that the use must be temporary, and does not create surface disturbance. The use of roads within WSAs to trap sites is considered an exception under the IMP, because gather operations enhance

wilderness values by maintaining the populations of wild horses at the established AML range and reduce impacts to wilderness characteristics.

Resource Monitoring

The BLM would inventory, monitor and treat noxious weeds at trap sites and temporary holding facilities in 2012, and thereafter, as needed. Treatment would be provided, if necessary, following guidance from Environmental Assessment, *Integrated Weed Management Program and Record of Decision, BLM Nevada Lands Portion, Eagle Lake, and Surprise Field Offices*, EA # CA350-04-05, CA370-04-05, May 2004 and DNA # CA370-07-02, February 2007). The BLM would also continue to monitor wildfire impacts, forage conditions, livestock and wild horse grazing utilization levels, water availability, herd populations, and animal health.

2.1.2 Alternative B. Manage Wild Horse Populations to Achieve Low AML; Return Gathered Non-Excess Horses To HMAs

Alternative B is the same as Alternative A except that no fertility control treatments would be applied to mares. The planned number of wild horses to be gathered and removed is the same as Alternative A, as shown in Table 2.1. If gather efficiencies do not allow for the attainment of the low AML during the gather period, the BLM would return to the HMAs and adjacent areas to complete Alternative B by removing any additional wild horses necessary to achieve the low range of AML. Any follow-up gather activities would be conducted in a manner consistent with those described in this EA for Alternative A. Funding limitations and competing priorities may further delay a follow-up gather and implementation of the population management plan.

All wild horses returned to the HMAs would follow the same procedures as the described in the Proposed Action "Removal of Excess Horses". Returned horses would be freeze marked to help track future distribution patterns and movements. The mares and studs to be returned to the herd would be selected to maintain a diverse age structure, specific herd characteristics, and conformation (body type) as identified in the *Herd Management Area Plans*. Post-gather, every effort would be made to return released wild horses to the same general area from which they were gathered.

2.1.3 Alternative C. Gather up to 95% of Wild Horses in the HMAs; Return All Gathered Horses after Applying Fertility Control to Mares

Under this alternative the BLM would use fertility control treatments as the only method for managing wild horse numbers within the HMAs. The BLM would gather a major portion of the existing wild horse population within the HMAs, up to 234 wild horses (95% of the population), implement fertility control treatments on all reproductive mares (estimated to be 117 mares) and return all wild horses back to the HMAs. Fertility control treatments would be applied as described in Alternative A, Section 2.1.

2.1.4 Alternative D. (No Action Alternative): Do Not Gather or Remove Excess Wild Horses

Under Alternative D the BLM would not gather or remove any wild horses during 2012 and would continue to manage the animals within the two Herd Management Areas at their current numbers, as described in Section 3.3.7. No fertility control treatments or active management would be applied, but population and resource monitoring would continue. The No Action Alternative would not be in conformance with the WFRHBA and would not achieve the identified Purpose and Need as described in Section 1.2; however, it is analyzed in this EA to provide a basis for comparison with the other action alternatives, and to assess the effects of not conducting a gather at this time.

2.2 Predicted Achievement of Objectives by Alternative

The objectives for the Proposed Action and other alternatives are outlined in Section 1.3. Table 2.2 below outlines the prediction of how each alternative would or not be able to achieve each objective.

Table 2.2 Predicted Achievement of Objectives by Alternative

Objective No.	Description of Objective	Achievement of Objective (Yes/No)			
		ALT. A	ALT. B	ALT. C	ALT. D
1.	Manage wild horses within established appropriate management level ranges to achieve a thriving ecological balance.	Yes	Yes	No	No
2.	Implement methods to slow the reproductive rate of wild horses within HMAs.	Yes	No	Yes	No
3.	Provide a sustainable level of forage and habitat for wild horses that is consistent with achieving BLM land health standards, objectives for other resources, and multiple-use management of public lands.	Yes	Yes	No	No
4.	Reduce the amount of future disturbance to wild horses from multiple gather operations.	Yes	Yes	No	No
5.	Maintain riparian areas in "Proper Functioning Condition" (PFC). Improve riparian areas and springs that are not in PFC, and are being affected by wild horse grazing, through population management of wild horses.	Yes	Yes	No	No
6.	Protect, maintain and enhance upland and riparian vegetation for wildlife habitat, including that for greater sage-grouse and other game and non-game species.	Yes	Yes	No	No
7.	Manage wild horses in a manner which promotes economic development and tourism.	Yes	Yes	Yes	No
8.	Maintain type, color, size, and confirmation of wild horses according to their historical characteristics.	Yes	Yes	Yes	Yes

2.3 Alternatives Considered but Dismissed from Detailed Analysis

The following alternatives were identified by the BLM or by the public through initial scoping comments, but were eliminated from detailed analysis for the reasons described below.

2.3.1 Alternative: Gather with Use of Bait (Feed) and/or Water Trapping Only and on Horseback

This alternative involves the use of bait (feed) and/or water to lure horses into trap sites as the sole capture method instead of a helicopter gather. Helicopters would not be used, and the personnel of the gather would be on horseback. This alternative was dismissed from detailed study for the following reasons:

1. Access for vehicles with the capability to transport wild horses is severely limited due to inadequate roads, and WSA designations. The lack of vehicle access to water sources inside the HMA boundaries would make it almost impossible to access selected water trap sites on public lands from which the wild horses would need to be transported. For these reasons, it is unlikely that a sufficient number of excess wild horses could be captured to bring the wild horse population to the AML.
2. Due to the large geographic area covered by the HMAs (approximately 170,000 acres), the use of bait or water to lure horses into trap sites would significantly extend the amount of time necessary to capture excess horses. This method of capture would make it impossible to complete the gather in a timeframe that achieves the purpose and need for the Proposed Action and would not reduce the wild horse population quickly enough to prevent continuing resource degradation, especially to riparian areas and water sources.
3. The practice of riding domestic horses for gathering wild horses has proven to be ineffective due to the small amount of distance that can be covered within a short time frame. This practice requires that the safety of the domestic horse is carefully monitored to be sure they do not become over tired from traveling long distances to keep up with the wild herds. For this reason, it is unlikely that a sufficient number of excess wild horses could be captured within a reasonable time frame to bring the wild horse population to the AML.

2.3.2 Alternative: Make On-The-Ground and Individualized Excess Wild Horse Determinations Prior to Gather and Removal

Some members of the interested public have advocated that BLM should use a three-tiered approach to removing excess wild horses from the range. This suggested approach envisions that rather than gathering the wild horses first and then sorting them, the BLM would first identify and euthanize any old, sick or lame animals on the range. Second, the BLM would identify, gather, and remove horses for which adoption demand exists by qualified individuals, such as younger horses, or horses with unusual and interesting markings. Last, the BLM would gather and remove any additional excess horses necessary to bring the horse population back to AML.

This proposed alternative is impractical, if not impossible, due to the large size of the HMAs, access limitations, and the additional stress and disturbance that would be caused to the wild horses. This alternative would be a much more stressful and less humane gather method for a number of reasons. First, wild horses roam freely across this large and diverse landscape. Most are very difficult to approach. Although some have suggested that it would be more humane to euthanize old, sick and lame horses prior to gather, humanely euthanizing sick or lame wild horses on the range would require an individual to get close enough to the animal to either deliver a single gunshot to the head or heart, or to somehow immobilize the animal to provide a lethal injection. It would be a significant challenge to separate a sick or lame animal from the rest of the herd so as to euthanize it on the range during gather operations as this alternative suggests.

Second, when animals cannot be readily approached or closely inspected, it is also difficult (if not impossible) to determine which animals are too sick or lame so as to require euthanasia. For example, a wild horse that has lost all of its teeth may have to be euthanized. However, this is not obvious just by looking at a wild horse on the range and it is necessary to inspect the animal's mouth to make such determination. By capturing the animals first, the BLM is able to examine each animal to make an informed determination as to whether the animal is too sick or lame or whether the animal can be treated and cared for. In this way, the BLM is able to assure that each animal is treated humanely with the least possible suffering.

Third, conducting consecutive gathers (after euthanizing old, sick and lame horses on the range) – first to roundup animals for which an adoption demand exists – and next to roundup the remaining excess as proponents of this approach suggest, would be far more stressful to the animals than conducting individual gathers at intervals of every 4 or 5 years. Conducting consecutive gathers in a short period of time would result in greater impacts to individual horses and to the herd's social structure, and would also increase the opportunity for gather-related injury or mortality--a small number of which may occur during a gather.

Fourth, previous recent BLM gathers in northeast California and northwest Nevada have shown that only a very small percentage of the overall population of wild horses are old, sick or lame animals that require humane euthanization. For example, during the Twin Peaks Gather in 2010, only seven animals (six horses and 1 burro) were found to have pre-existing conditions that required them to be euthanized, compared to the 1,637 wild horses and 162 burros that were gathered and removed as excess animals. During the Twin Peaks Gather only 0.37% of wild horses and only 0.62% of wild burros were found to be old, sick, or lame during the gather. If this alternative had been implemented, up to 1,631 wild horses and 161 burros would have undergone the stress and disturbance of an additional gather operation in order to treat and/or euthanize these seven individuals first. One reason that the number of old, sick, and lame animals is so low is that BLM personnel have several opportunities to observe wild horses each year, even if a gather is not planned. When the BLM discovers an injured animal on the range that requires euthanization, that action is taken as soon as possible.

Fifth, because there is only a limited adoption demand for wild horses removed from the range, it is not possible to achieve AML within the HMAs by removing only wild horses that are adoptable. If the BLM were to use a tiered approach to first remove adoptable horses, those

horses would need to be separated from the rest of the herd, causing disruptions to the horses on the range. After separating and removing those horses, BLM would then have to return to remove all remaining excess wild horses and a sufficient number of non-excess horses for population control treatment (under the Proposed Action). The result would be the equivalent of two sequential gathers for the wild horses within the HMAs, which would be far more stressful for the horses and require much more contact with wranglers and helicopters than if all of the horses are gathered first and only then sorted.

Due to the above reasons, this alternative was eliminated from any further consideration. See Section 2.1. *Removal of Excess Horses* for additional information.

2.3.3 Alternative: Remove or Reduce Livestock within the HMAs

This alternative would address the issue of excess wild horses in the Buckhorn and Coppersmith HMAs through the removal or reduction of authorized livestock grazing, instead of by gathering and/or removing wild horses from the HMAs. This alternative would be contrary to both Resource Management Plans, and would allow the wild horse populations to remain above AML. It would therefore not meet the *Purpose and Need* for the Proposed Action as identified in Section 1.2:

> *The purpose of the Proposed Action is to remove excess wild horses from the Buckhorn and Coppersmith HMAs in order to manage population levels consistent with the established appropriate management levels (AMLs).*

This alternative is also inconsistent with the *Wild Free-Roaming Horses and Burros Act of 1971,* which directs the Secretary to manage wild horses in conjunction with other multiple uses and to immediately remove excess wild horses. Furthermore, livestock grazing can only be reduced or eliminated if BLM follows regulations at 43 CFR § 4100. Such changes to livestock grazing cannot be made through a wild horse gather decision.

The current apportionment of multiple-use grazing between livestock and wild horses was established through multi-year public review processes culminating in 2008 with the development of the *Surprise Resource Management Plan*. Recent monitoring data and land health assessments do indicate that riparian resources are being impacted by livestock and wild horses. Changes to the level of livestock grazing would be addressed through the grazing permit renewal process.

The current population of wild horses in the Buckhorn HMA above AML is resulting in adverse impacts to water sources, riparian/wetland sites, and vegetation. The current level of authorized livestock grazing has been established through forage inventories and monitoring data collected over the past 50 years. Forage allocations for livestock have been made in accordance with forage and habitat needs for wildlife and wild horses. The BLM has not received any new information that would indicate a need to change the level of livestock grazing at this time. Furthermore, the BLM establishes grazing systems to manage livestock grazing through specific terms and conditions that confine grazing to specific pastures, limit periods of use, and set utilization standards. These terms and conditions serve to minimize livestock grazing impacts to vegetation during the growing season and to riparian zones during the summer months.

Wild horses, however, are present year-round, and their impacts to rangeland resources cannot be controlled through establishment of a grazing system, such as for livestock. Thus, impacts from wild horses can only be addressed by limiting their numbers to a level that does not adversely impact rangeland resources and other multiple uses. While BLM is authorized to remove livestock from HMAs "*if necessary to provide habitat for wild horses or burros, to implement herd management actions, or to protect wild horses or burros from disease, harassment or injury*" (43 CFR § 4710.5), this authority is usually applied in cases of specific emergency conditions and not for the general management of wild horses under the WFHBA, as wild horse management is based on the land-use planning process, multiple use decisions, and establishment of AML. For these reasons, this alternative was eliminated from further consideration.

2.3.4 Alternative: Re-evaluate the Current Established Appropriate Management Levels

Some of the public comments suggested an alternative for BLM to revise/increase the AML ranges, rather than remove wild horses from the Buckhorn and Coppersmith HMAs. This alternative was eliminated from further consideration because the AMLs have been examined and adjusted in recent years based on monitoring data and the results of land health evaluations, and monitoring data show that there is currently an over-population of wild horses leading to resource concerns. The available data indicates that excess wild horses are present in the Buckhorn and Coppersmith HMAs and that excess wild horses should be removed to bring the population to the established appropriate management level (AML) for wild horses. This alternative would not meet the *Purpose and Need* for the Proposed Action, as described in Section 1.2. The history of the planning efforts that established the current level of AMLs is described in Section 1.5. The current AMLs are based on established biological and cultural resource monitoring protocols, and land health assessments, as described in Sections 3.4, 3.7 and 3.10, and were approved by the *Surprise RMPs*, 2008.

The results of monitoring and land health assessments indicate that some resource conditions are declining in the Buckhorn and Coppersmith HMAs due to the current high level of utilization and trampling from wild horses. These results indicate that upward adjustments to the appropriate management level (AML) for wild horses are not justifiable at this time, and that the BLM should continue to manage wild horses at the established AMLs by removing excess wild horses. If future data suggests that adjustments in the AMLs are needed (either upward or downward), then changes would be based on an analysis of monitoring data, including a review of wild horse habitat suitability, such as the condition of water sources in the HMAs. For the reasons stated above, this alternative was eliminated from further consideration.

2.3.5 Alternative: Delay Gather for Two to Three Years

This alternative would postpone the gather for two to three years. The current high (above AML) level of wild horse population is resulting in adverse impacts to water sources, riparian/ wetland sites, and vegetation. Postponing the gather would not meet the *Purpose and Need* for the Proposed Action, as described in Section 1.2. Wild horse numbers would continue to increase by approximately 17 to 23% per year, and the resource problems already associated with the current over-population of wild horses would be further exacerbated. For these reasons, this alternative was dropped from detailed analysis.

2.3.6 Alternative: Increase Water Sources and Other Range Improvements in order to Increase the Current Established Appropriate Management Levels

This alternative would not meet the *Purpose and Need* for the Proposed Action, as described in Section 1.2. Natural water is limited during drought years in the Buckhorn and Coppersmith HMAs due to the fact that the HMA lies within a very arid environment. Most of this area receives an average of 8 to 12 inches of precipitation per year. The Buckhorn and Coppersmith HMAs have a variety of natural and manmade water sources that provide water for wild horses, wildlife and permitted livestock (see Section 3.2). Many of these water sources have been developed by the BLM and/or grazing permittees to provide a higher quality water source and to protect the source itself from grazing and trampling. However, most water sources are not fenced off from grazing animals and are therefore susceptible to damage from grazing and trampling when animal numbers get too high.

The types of developed water sources within the HMAs are usually stock ponds fed from a natural spring, or shallow ephemeral lakes that rely on runoff water to fill them, and are therefore not consistent drinking water sources in drought years. The geology in the area also does not make it conducive to drilling new wells for reliable water sources for wildlife, wild horses, or livestock. Most water developments are seasonal in nature, and remain dry in many years, or during portions of the year. The reliable water sources within the HMAs are located on private land, may be available to wild horses. Even if new water developments were constructed, they would most likely not provide year-long water for wild horses, as the most reliable (year-long) water sources have been previously developed. It is unlikely that developing additional partial year water sources would allow for an increase in the appropriate management levels of wild horses. Cross fencing of individual units or pastures within the HMAs would be another range improvement practice that would increase grazing efficiency of wild horses related to where water sources are located, and could possibly allow for an increase in the established AMLs. However, the Buckhorn and Coppersmith HMAs have very limited cross fencing within them. This is due to the following reasons:

1. The BLM is required to manage wild horses for "free roaming" behavior, which does not support creating pasture or home range subdivision fences.

2. *The Interim Management Policy for Lands under Wilderness Review*, BLM H-8550-1 (July 1995) precludes the construction of new range improvements that involve ground disturbance, such as cross-fences within the Buffalo Hills Wilderness Study Area.

Due to the constraints listed above, it is not likely that the BLM could construct additional water improvements or additional cross fences in the Buckhorn and Coppersmith HMAs in the future. This alternative would not meet the Purpose and Need of the Proposed Action, and for these reasons, this alternative was dropped from detailed analysis.

2.3.7 Alternative: Provide Ranchers Funding or Tax Incentives to Retire Grazing Allotments and Transfer AUMs to Wild Horses

An alternative identified during the public scoping process was to transfer livestock AUMs to forage allocations for wild horses by paying or otherwise incentivizing ranchers. The BLM does

not have the statutory authority to pay ranchers, or to provide tax incentives to ranchers, in order to promote the transfer of livestock AUMs to wild horse AUMs. This would require statutory changes at the Congressional level. This alternative was therefore dropped from detailed analysis.

2.3.8 Alternative: Promote Ecotourism for Wild Horse Viewing and Give Proceeds to Permittees to Convert Livestock AUMs to Wild Horses

This action would require amendments to the Surprise RMP, which would take a minimum of two years, and probably much longer because of various designations of the Buckhorn and Coppersmith HMAs. Wild horses placed in an eco-sanctuary are excess horses removed from the range, and horses held in eco-sanctuaries must be separated from wild herds to allow for separate management and to prevent reproduction.

While very limited tourism related to wild horse viewing does occur, the Buckhorn and Coppersmith HMAs are in a very remote location, with very few roads, and very few developed campgrounds or facilities. The closest large urban areas are Reno, Nevada and Redding, California. There are currently no businesses within Cedarville, California (or other local towns) that cater to ecotourism. The BLM manages the land within the Buckhorn and Coppersmith HMAs for "dispersed recreation", which is defined as: "recreational activities that do not require developed sites or facilities". The BLM manages dispersed recreation areas free of charge to the public for hiking, camping, hunting, wildlife viewing, etc. Wild horse viewing is part of current dispersed recreation activities. The BLM is not authorized to begin a business venture such as ecotourism. To convert a permittee's livestock grazing permit to a permit for wild horses for ecotourism would also require a land use plan amendment and statutory changes. This alternative was therefore dropped from detailed analysis.

2.3.9 Collect More Resource Data on the Buckhorn and Coppersmith HMAs by Using Partnerships with Universities, Non-Government Agencies and Volunteers

Some public comments suggested an alternative whereby BLM would collect more resource data and defer any gathers until such data has been collected and analyzed. This alternative assumes that insufficient data exists at present to determine whether excess wild horses are present in the Buckhorn and Coppersmith HMAs. However, based on wild horse population inventory data and monitoring data collected using standard and approved monitoring protocols, the BLM has sufficient information on wild horse populations and resource conditions within the HMAs to make an excess determination and to analyze the alternatives within this EA. The BLM has therefore eliminated this alternative from further consideration.

2.3.10 Utilize the BLM's Discretion to Designate this Area to be Managed Principally as a "Range" for Wild Horses

The Code of Federal Regulations (43 CFR, Subpart 4710.3-2) states: "Herd management areas may also be designated as wild horse or burro ranges to be managed principally, but not necessarily exclusively, for wild horse or burro herds." This alternative is outside the scope of the Proposed Action, as it would require the BLM to officially designate these public lands as a

"wild horse range", thereby eliminating other currently authorized uses of the public lands such as livestock grazing, which constitutes a land use plan decision. This action would require an amendment to the Surprise RMP, following the process set forth in the regulations found at 43 CFR Part 1600. The BLM has therefore eliminated this alternative from further consideration.

3.0 AFFECTED ENVIRONMENT

3.1 General Environment

The Buckhorn and Coppersmith HMAs consist of approximately 170,000 acres of public and private land within Lassen and Modoc Counties in California, and Washoe County, Nevada, (Map 1). The two HMAs contain vast, diverse, and remote landscapes, with unique and important biological, geological, scenic, and cultural resources. Besides providing forage and habitat for wild horses, the HMAs also provide important habitat for several wildlife species, including the greater sage-grouse, pronghorn, and mule deer. The predominant land uses within the HMAs are livestock grazing, wilderness recreation, and general recreation, including hunting.

The BLM has designated several unique areas within the Buckhorn and Coppersmith HMAs that contain important biological and/or cultural resources that justify specialized management actions to protect these resources, as well as one Wilderness Study Area designated by Congress. These include:

- The Buffalo Skedaddle and Vya Sage-grouse Population Management Units
- Portions of the Buffalo Hills Wilderness Study Area
- The Buckhorn Backcountry Byway
- The Tuledad/Duck Flat Cultural Resource Management Areas

The Buckhorn and Coppersmith HMAs encompass elevation ranges from 4,500 feet to 8,000 feet. Precipitation has averaged 12 to 18 inches per year over the long-term. Temperature extremes average from -10 degrees Fahrenheit in winter to 100 degrees Fahrenheit in summer.

Native vegetation ranges from higher elevation communities of mountain mahogany, quaking aspen, and mountain brush communities, to lower elevation communities of salt desert shrub and Wyoming big sagebrush. The predominant vegetation type is comprised of perennial grasses, forbs, and a mixture of shrubs. Western juniper is common above 5,500 feet in elevation.

Potential vegetation in the Buckhorn and Coppersmith HMAs can be generally described based on three vegetation communities and elevation. They include:

a. 4,800 to 5,500 feet – Salt desert shrub and Wyoming big sagebrush communities with pockets of basin wildrye and winterfat.

b. 5,500 to 6,400 feet – Big sagebrush, low sagebrush, and bitterbrush communities.

c. 6,400 to 7,200 feet – Mountain big sagebrush, low sagebrush, and mountain mahogany communities with pockets of aspen.

In the absence of wildfire western juniper has increased greatly within the big sagebrush and mountain sagebrush communities. This is especially true in the Coppersmith HMA. The Buckhorn HMA experienced a substantial wildfire in the 1940s, so it has less juniper expansion.

The most important environmental change agents that have impacted the ecological condition of plant communities in the Buckhorn and Coppersmith HMAs are:

- Historic (pre-1970) livestock grazing at high utilization levels, particularly during the spring and summer, which resulted in degraded plant communities;
- Year-long grazing use by wild horses at populations that are above the established AML range;
- The expansion of western juniper into big and mountain sagebrush communities; and
- Increased sagebrush canopy cover in some areas due to lack of wildfire.

3.2 Water Sources and Availability

Water availability within the two HMAs varies from year to year, depending on the annual amount of snow melt and rainfall. Within the Tuledad Allotment there are approximately 77 pit reservoirs, 54 stream reaches, 24 developed springs, 23 lakes, 8 windmills/wells, and 63 undeveloped small, seasonal springs or seeps. Due to drought conditions over the past four years, trampling by cattle and wild horses, and lack of proper maintenance, several developed springs are not functioning properly. Many of the creeks are considered ephemeral, and do not contain water every year. Additionally, there are many water sources used by wild horses that are not included in the tally above because they are located on private lands.

The U.S. Drought Monitor showed abnormally dry conditions on portions of the two HMAs from 2009 to 2012. While 2011 was a wet year, weather patterns in the area follow a pattern of having more years of below average precipitation levels than years having above average precipitation levels. The winter of 2012 was very mild and the region is suffering due to the drought conditions. Precipitation totals in Cedarville from October 2011 through June 2012 were 70% of average.

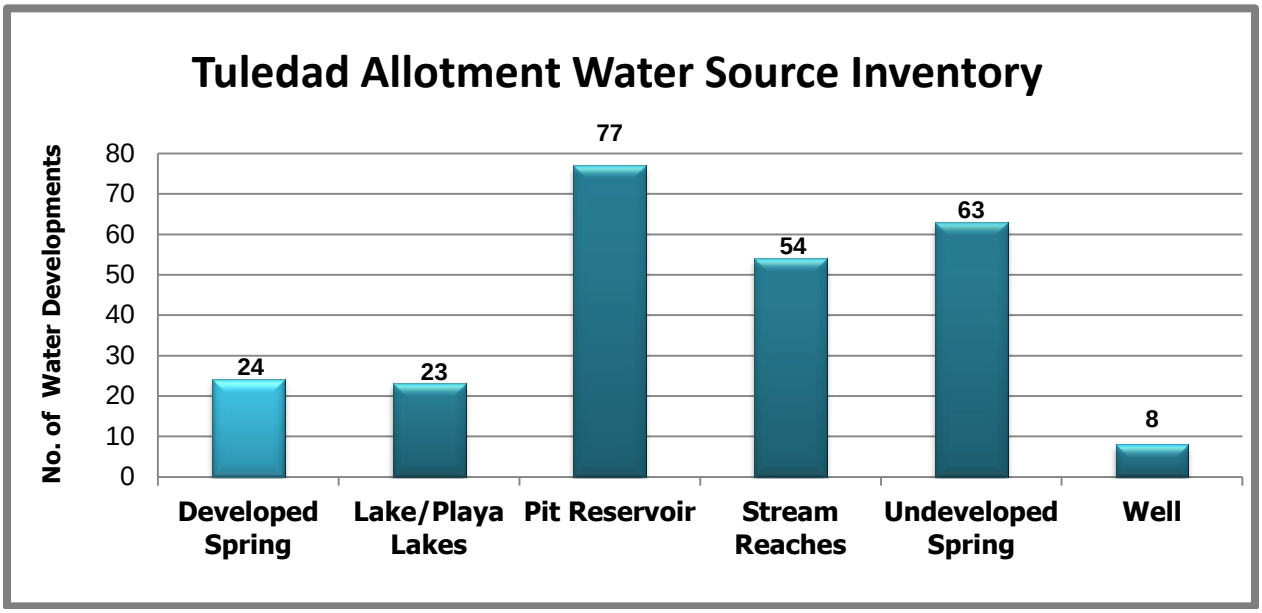
The lack of consistently available drinking water during drought years is the limiting essential habitat factor for all animals that use forage and habitat within these HMAs. This creates resource issues on vegetation and impacts the condition of the water sources when wild horse populations exceed the established appropriate management levels. Many water sources are seasonal, and dry up in the summer and fall. Many of the water sources are filled from winter runoff and rainfall, which flow into pits and reservoirs, and most of these do not fill in dry years. Due to animals concentrating near water sources, the degraded condition of riparian areas and wetland (spring) sites is a major resource concern within the HMAs when wild horse numbers are above the high range of AML.

Water Resources – Buckhorn HMA

The majority of the Buckhorn HMA occurs within the Duck Flat Watershed, which includes several ephemeral lakes or depressions, including Duck Flat. There are two small areas south of the Buckhorn HMA (Rowland Spring in the extreme south and Buffalo Hills on the extreme southeast corner of the HMA) that includes the Smoke Creek Desert Watershed. There is also a small area around SOB Lake and to the southwest that is in the Madeline Plains Watershed.

Generally, water supply is not a limiting factor for wild horses in the Buckhorn HMA, except during drought years when ephemeral lakes, reservoirs and small springs will go dry. There are several perennial creeks scattered across this HMA that are used by wild horses. These water sources and associated riparian areas occur on both private and public lands. Based on past Rangeland Health Assessments, water quality within the HMA is generally adequate for the benefit of livestock, wildlife, and wild horse water.

Figure 3.2 Types and Number of Water Sources in the Tuledad Allotment



Water Resources – Coppersmith HMA

The majority of the Coppersmith HMA occurs within the Duck Flat and Lower Alkali Lake Watersheds and drains north and east into Duck Flat. One small portion of the Coppersmith HMA (Boot Lake, on the extreme west side of the HMA) is in the Madeline Plains Watershed and drains south into Dodge Reservoir.

Most springs throughout the HMA show heavy past and current livestock and horse use. Many springs are developed for stock water. These developments generally occur on smaller springs, and many have exclosures built around a spring or head box and the water is piped off-site to a trough. There are several exclosures that have been built to protect larger riparian resources including Bud Brown (506 acres), Lower Ant Spring (14 acres), and Nova Spring (8 acres). Water quality within the HMA is generally adequate for the identified benefit of livestock, wildlife, and wild horse water.

In this HMA, wild horses tend to prefer ephemeral lakes and reservoirs in the open areas, not within the juniper woodland thickets. Water supply is not ordinarily a limiting factor for wild horses in the HMA. However, on dry years, the lakes, reservoirs, and some of the seeps and springs go dry and wild horses tend to concentrate on a limited number of perennial watering sites, which are often on private lands.

Water Developments

Several water developments within the Buckhorn and Coppersmith HMAs have been constructed and maintained by livestock grazing permittees in coordination with the BLM. The water developments were originally designed for livestock operations, however, wild horses and wildlife also benefit from the water at these sites. Water developments are constructed in areas where other natural water sources are absent, or are ephemeral in nature. This allows livestock, wild horses, and wildlife to utilize forage in those areas that were previously too far away from drinking sources.

Reservoirs are earthen structures designed to retain water from runoff. Generally, these types of developments provide water for a few months out of the year or when heavy rainfall is received. Livestock grazing periods or seasons of use within an allotment are usually planned according to when water is available in a certain area.

Spring developments typically consist of a spring-box, a short pipeline, and a water trough. The area around the spring is sometimes fenced off from livestock to protect the functionality of the spring. Some springs provide water for the entire year, while others can dry up during drought years or provide only seasonal water. Some springs support a meadow area. Meadows range in size from less than 0.1 acre to tens of acres in size, primarily in relation to the quantity or extent of the spring.

3.3 Wild Horses

3.3.1 Herd History

The region where these two HMAs are located did not have horses until after Euro-American contact, when large numbers of horses were being imported into the area for the purpose of starting herds for ranching operations, and for US Army remounts to support World War I. Ranchers such as the Marr Brothers went into business with the federal government raising horses for the Army. Ranchers and settlers also turned draft and saddle horses loose on the open range, gathering them as the need arose. Other horses escaped or were abandoned or were set loose when hard times made feed unaffordable.

Today's wild horses are also the descendants of carriage and farm horses that were retired to the range in the early 1900's as they were replaced by automobiles and gasoline-fueled farming equipment. During the Great Depression, farm and ranch horses were often abandoned to the range when farmers and ranchers went out of business. Local cattle and sheep operations continued to own large numbers of horses for their overall livestock operation on BLM lands up until the late 1960's. Undoubtedly some of these horses also escaped, or were turned loose, contributing to establishment of wild herds. The first aerial inventories of these HMAs were conducted in 1983 for Buckhorn and in 1985 for the Coppersmith HMA.

Buckhorn HMA – This area contains horses thought to originate from Spanish stock diluted with ranch stock and US Cavalry remounts prior to and during World War I. The influence of the US Cavalry Remounts Program is especially apparent in these horses.

Coppersmith HMA – This area contains horses thought to originate from Spanish stock diluted with ranch stock and US Cavalry Remounts prior to and during World War I. Many of the horses in this area have characteristics common to draft breeds, Morgan horses and quarter horses.

3.3.2 Herd Characteristics

Buckhorn HMA

Based on 2009 capture data, wild horses in the Buckhorn HMA predominantly exhibit bay, black, sorrel, and brown coat colors; though many horses have varied colors, including palomino, dun, grulla, buckskin, chestnut, pinto and red roan. Wild horses within the HMA are commonly 14 - 16 hands tall, of slight to moderate build, and average 900 to 1100 pounds in weight.

Coppersmith HMA

Based on 2009 capture data, wild horses in the Coppersmith HMA predominantly exhibit bay colors; though many horses have varied colors, including palomino, dun, grulla, buckskin, chestnut, pinto and red roan. Considering the Buckhorn and Coppersmith HMAs are adjacent to one another and a fence, in the need of repair, is the only separation between the HMAs, the horses have very similar characteristics. Wild horses within the HMA are commonly 14 - 16 hands tall, of slight to moderate build, and average 900 to 1100 pounds in weight.

3.3.3 Sex Ratio

Sex ratios for wild horses in these two Herd Management Areas typify what is found in other HMAs in the region. During the last gathers of these herds in 2009, the sex ratio was documented to be 55% mares and 45% studs in the Buckhorn HMA, and 58% mares and 42% studs in the Coppersmith HMA.

3.3.4 Movement

The individual HMA boundaries are fenced, but the fences may be down or in disrepair in some places. There are a few small fenced areas (exclosures) that have been constructed to protect important resources such as riparian or cultural sites. Wild horses within these HMAs are known to travel extensively in their individual HMA and sometimes onto adjacent lands, depending on climatic conditions. Wild horses typically follow an elevation pattern of seasonal migration based on forage conditions and snow cover, grazing at higher elevations during the summer and fall months, and at lower elevations during the winter months (Berger 1986).

When gates are left open in the HMA, or fences are in disrepair (often due to wild horses damaging the fences) this allows wild horses to broaden their range and intermingle with other herds within different HMAs. The Buckhorn and Coppersmith HMA boundaries are fenced, but the boundary fence between the two HMAs is in disrepair, so there is documented horse movement between the two HMAs. There is also documented horse movement between the Buckhorn HMA and the Twin Peaks HMA to the South, where that fence is in disrepair.

3.3.5 Wild Horse Social Structure

Wild horses form bands based upon the "harem model" in that they usually consist of one adult male and a group of females. A single stallion controls a number of mares for the primary purpose of siring foals. The harem stallion attempts to keep his mares in the band and fights off other stallions attempting to replace him as the harem stallion. Additionally, the stallion looks to acquire additional mares to increase his ability to sire additional foals (Isvaran, 2005). When a mare pregnant by one harem male subsequently joins another harem, she often fails to carry that fetus to full term, which also leads to the harem stallion being able to sire foals of his own (Berger, 1986). In order to avoid inbreeding, both male and female colts sired by the harem stallion are either driven from the harem (males) or allowed to be taken by another harem male (females) as they approach reproductive age (Berger, 1986). Males without harems may join bachelor bands or remain solitary.

Reproductive success in wild horses is density dependent, as well as habitat dependent. Berger observed that horses in medium to poor quality habitat had less dense populations, and had substantially lower reproductive success. One measure of habitat quality was the presence of meadows. Bands that spent more time foraging in meadows had higher reproductive success than those that spent less time in meadows. Another measure of this preference was the relative use of plant communities during fall-winter-spring compared to availability of the communities on the landscape. Meadows received the highest use in proportion to their availability. Meadow use was 61 times greater than predicted, based upon the area of the landscape occupied by the meadows (Berger 1986).

Wild horses are known to behaviorally displace native wildlife species. Berger (1986) documented 20 instances of wild horses forcing mule deer, pronghorn antelope and bighorn sheep to physically retreat.

3.3.6 Wild Horse Body Condition and Health

The body condition score of wild horses within these two HMAs typically varies between ratings of "3 – Thin" and "5 – Moderate", based on the Henneke System (Henneke, 1983). Habitat factors that affect animal health include the amount and quality of forage, the availability of drinking water, and the availability of cover and space. Wild horses typically exhibit the lowest body condition in late winter and early spring.

Few predators exist in these HMAs to control wild horse populations (BLM, 2008). In the nearby Granite HMA, Berger (1986) determined that predation was "insignificant" and documented one apparently sick foal attacked by a coyote, while healthy foals were "never bothered". Coyotes are not prone to prey on wild horses unless the horses are young, or extremely weak. Other predators such as wolves or black bears do not exist in these HMAs at this time.

In order for populations of wild and free roaming animals to naturally remain at stable population numbers, a control factor is needed, such as a predator. In these two HMAs, the only potential predator on wild horses is the mountain lion. Recent BLM observations have recorded a few mountain lion kills on wild horses in the Twin Peaks and High Rock HMAs, but these have been rare and sporadic. The number of horses or foals taken by mountain lions

is small enough that at this time it cannot be considered a significant factor in population control. For this reason it becomes the function of the BLM to control the populations of wild horses by gathering and removing animals from the HMAs, or by other means, such as fertility control.

Weather related factors may be the most important source of wild horse mortality in the HMAs. Winter range is lacking within the Buckhorn and Coppersmith HMAs due to high elevations and snow cover. During severe winters, horses move to areas of low snow cover to maximize forage availability. Low snow cover tends to be associated with areas where the wind blows the snow on ridge tops at higher elevations. There has been documented mortality in areas of northwestern Nevada where horses became trapped at higher elevations during strong winter storms, and died before being able to reach more protected areas (Berger 1986).

Wild horses have effectively adapted to the rigors of the western rangeland environment, so few diseases affect them. Wild horses are a long-lived species with documented foal survival rates exceeding 95%. Survivability rates for foals and older horses that have been documented through research efforts are shown in the following table:

Table 3.3.6 Survival Rates for Wild Horses

Wild Horse Range	Survival Rate	
	Foals	Older Horses
Pryor Mountain Wild Horse Range, Montana [1/]	> 95%	93% (All horses less than 15 years)
Granite Range HMA, Nevada [2/]	> 95%	92% (All horses less than 15 years)
Garfield Flat HMA, Nevada	> 95%	92% (All horses less than 24 years)

[1/] Source: Garrott and Taylor, 1990 [2/] Source: Berger, 1986

3.3.7 Population Inventory Data

Buckhorn HMA Population Inventory

The Buckhorn HMA was last gathered in 2009, with a total of 193 horses removed. The last aerial census for the Buckhorn HMA was conducted in July 2010, when a total of 129 wild horses were counted. The current estimated population of 172 horses is based on a 20% annual recruitment rate since 2010. The AML for this HMA is 59 to 85 wild horses.

Coppersmith HMA Population Inventory

The Coppersmith HMA was last gathered in 2009, with a total of 247 horses removed. The last aerial census for the Coppersmith HMA was conducted in July 2010, when a total of 53 wild horses were counted. The current estimated population of 75 horses is based on a 20% annual recruitment rate since 2010. The AML for this HMA is 50 to 75 wild horses.

Table 3.3.7 Determination of Excess Wild Horses by Population Size and Increase

Location	2012 Wild Horse Population[1/] (No.)	Appropriate Management Level (No.)		Current No. of Horses Above AML Range		Annual Rate of Population Increase[2/]
		Low	High	Low	High	
Buckhorn HMA	172	59	85	113	87	16%
Coppersmith HMA	75	50	75	25	0	19%
Total/ Average	247	109	160	138	87	Average: 17.5%

[1/] The 2012 population estimate for Buckhorn and Coppersmith HMAs is based on a July 2010 Inventory.

[2/] Growth rates are the result of: 1) increased annual population due to foaling (17 to 23%), and 2) wild horses moving into the HMAs from other areas, as described in Section 3.3.4.

Table 3.3.8 Determination of Excess Wild Horses by Forage Allocation and Current Use

Location	2012 Wild Horse Population[1/] (No.)	2012 Actual Use (AUMs)	Wild Horse Forage Allocation by AML (AUMs)		Amount of Forage Exceeding Allocated Amount in 2012 (AUMs)	
		Pop. X 12=	Low	High	Low	High
Buckhorn HMA	172	2064	708	1020	1356	1044
Coppersmith HMA	75	900	600	900	264	0
Total	247	2964	1308	1920	1620	1044

[1/] The 2012 population estimate for Buckhorn and Coppersmith HMAs is based on a July 2010 Inventory.

Since 1983, the populations of wild horses in the Buckhorn and Coppersmith HMAs have steadily increased, despite the fact that fifteen wild horse gathers have taken place between the individual HMAs, as described in Section 3.3.8. The Figures below illustrates the number of wild horses counted (or estimated between actual inventories) over the past 20 years, as compared to the high and low ranges of the established total AML for the two HMAs.

Figure 3.2 Estimated Wild Horse Population, Buckhorn HMA, 1993 to 2012

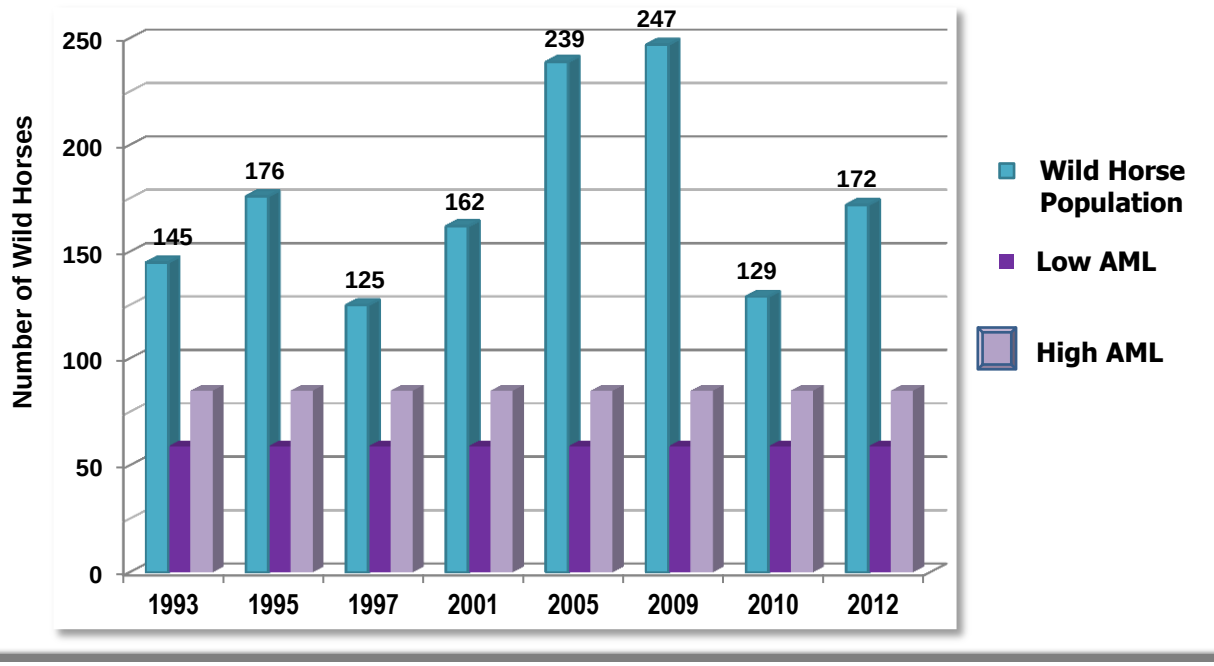
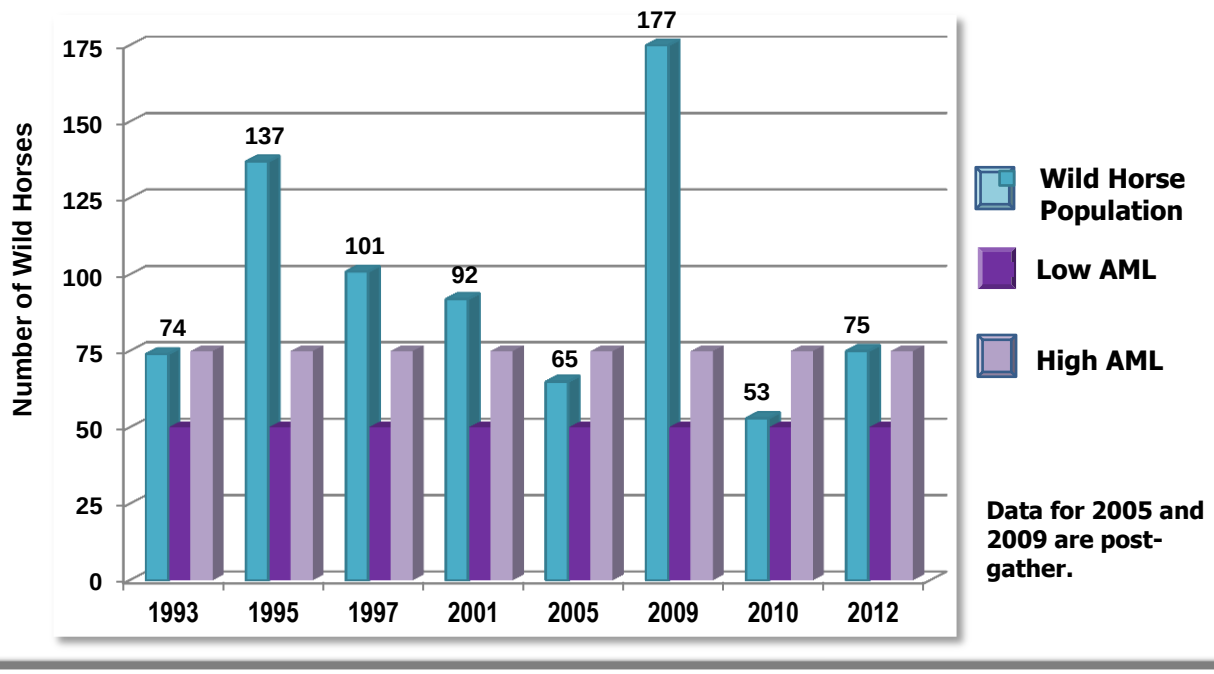


Figure 3.3 Estimated Wild Horse Population, Coppersmith HMA, 1993 to 2012



3.3.8 Gather History

Between 1983 and 2009 the BLM completed fifteen wild horse gather operations (primarily using a helicopter) within the two HMAs. All gather activity was conducted in a manner similar to what is proposed for in this EA, through the use of helicopter herding of horses into temporary trap locations. The numbers of wild horses gathered and removed in each year are shown in Figures 3.5 – 3.7 below. In some years, all two HMAs were gathered. The last gather operation for all two HMAs was completed by the BLM in 2009. The gather history for each individual HMA is provided below.

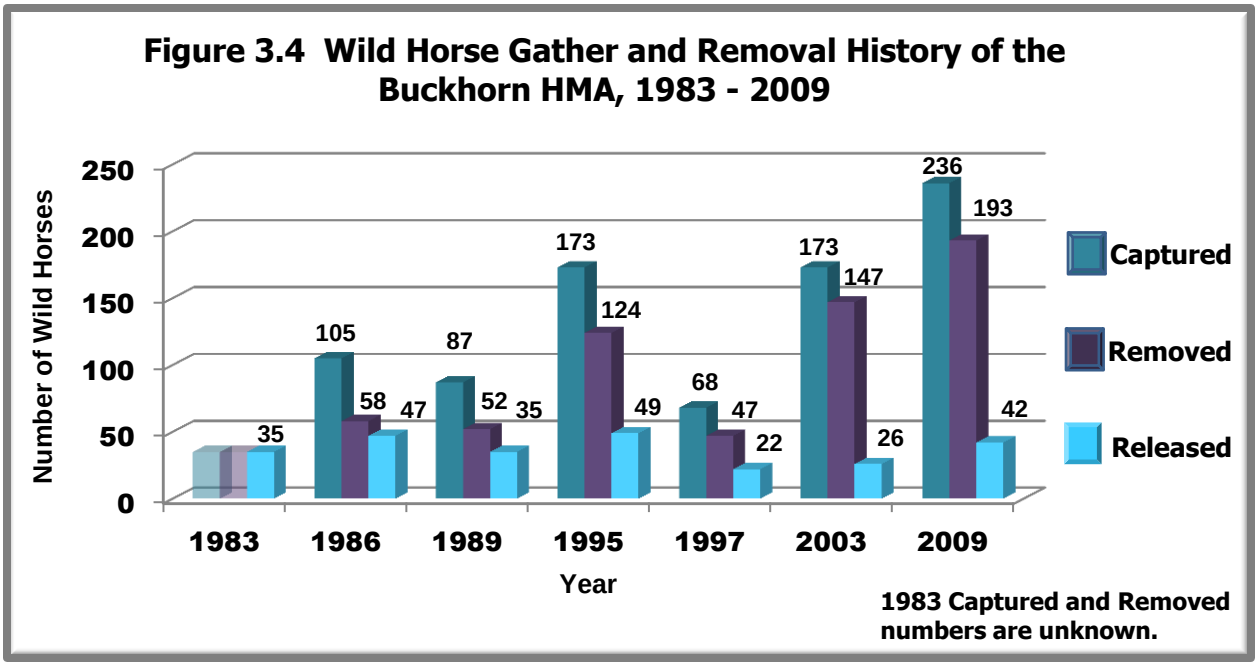
Buckhorn HMA Gather History

The Buckhorn HMA was last gathered in 2009. At that time, 236 wild horses were gathered, 193 removed, and 42 released back to the range. Twenty released mares were treated with fertility control (PZP-22) vaccine, and were freeze-marked for future HMA identification. This information is useful for assessing wild horse movement between HMAs. After the gather in 2009, an estimated 61 wild horses remained within the HMA, with a sex ratio of 50 males/50 females.

Table 3.3.9 Buckhorn HMA Wild Horse Gather History

Year	No. Captured	No. Removed	No. Released
1983	Unknown	Unknown	35
1986	105	58	47
1989	87	52	35
1995	173	124	49
1997	68	47	22*
2003	173	147	26
2009	236	193	42

*Includes two horses from a different HMA.

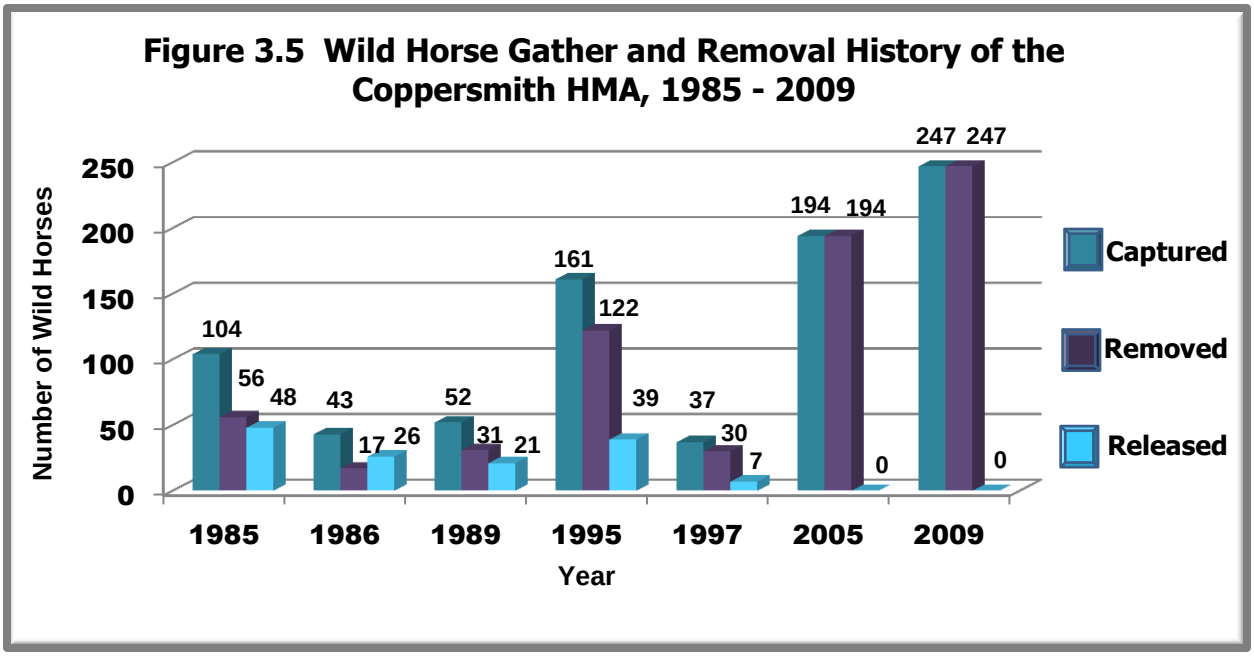


Coppersmith HMA Gather History

The Coppersmith HMA was last gathered in September and November 2009. At that time, 247 wild horses were gathered, and all of these horses were removed, and none were released back to the range. After the gather in 2009, an estimated 61 wild horses remained within the HMA with a sex ratio of 50/50 males/females.

Table 3.3.10 Coppersmith HMA Wild Horse Gather History

Year	No. Captured	No. Removed	No. Released
1985	104	56	48
1986	43	17	26
1989	52	31	21
1995	161	122	39
1997	37	30	7
2005	194	194	0
Sept 2009	130	130	0
Nov 2009	117	117	0
Total 2009	247	247	0



3.3.9 Genetic Diversity

Most wild horse herds sampled have high genetic heterozygosis. Genetic resources are lost slowly over periods of many generations, and wild horses are long-lived with long generation intervals (Singer, 2000). The population size of the wild horses in conjunction with the expected degrees of movement within and outside of the HMAs, should promote optimum conditions for genetic health even after excess horses are removed. The open nature of the Buckhorn and Coppersmith HMAs allows wild horses to broaden their range and intermingle with other herds from other HMAs, as described in Section 3.3.4.

The BLM has determined in prior decisions that maintaining wild horses within the established AML range will allow for sufficient genetic diversity. In June 2004, the BLM Surprise Field Office received the Genetic Analysis report for the Buckhorn HMA from Dr. E. Gus Cothran of the Department of Veterinary Science University of Kentucky. The report showed that there was no statistical evidence of inbreeding as evidenced by population diversity within the herd. The herd appears to have originated from North American saddle horse stock. These are riding type horses and are the type of horses that could have been released by ranchers. Wild horses within these HMAs can consist of many colors such as bay, brown, chestnut, roan, pinto, palomino, sorrel, black, buckskin, grey, and dun.

In the future, if there is a need to augment the genetic pool by the introduction of animals from other herds, BLM would augment the population with young mares that will likely enter the breeding population, as indicated Dr. Gus Cothran's genetic analysis report (Cothran, 2004). Future genetic analysis of gathered horses would be used to determine actions necessary to keep the populations viable and self-sustaining. Any animals introduced into the herd would meet the general characteristics (color, size, type, etc.) as from the existing population.

3.4 Cultural Resources

The Buckhorn and Coppersmith HMAs are located within Lassen County, California and Washoe County, Nevada. Ethnographically, this area was part of the territory of the Northern Paiute; within the territorial boundaries of the Kidütökadö band. Many members of the Kidütökadö continue to reside at the Fort Bidwell Reservation. Historically, this area has been used for sheep, cattle, and domestic horse grazing by Euro-Americans. Cultural resource inventories within the overall project area indicate that the area was used by prehistoric people for resource procurement activities. In addition, seasonal, temporary campsites were established for the purposes of procuring tool stone material, game, and plant resources. Historic resources are associated with livestock grazing activities and early homesteading, emigrant and military trails, and mining.

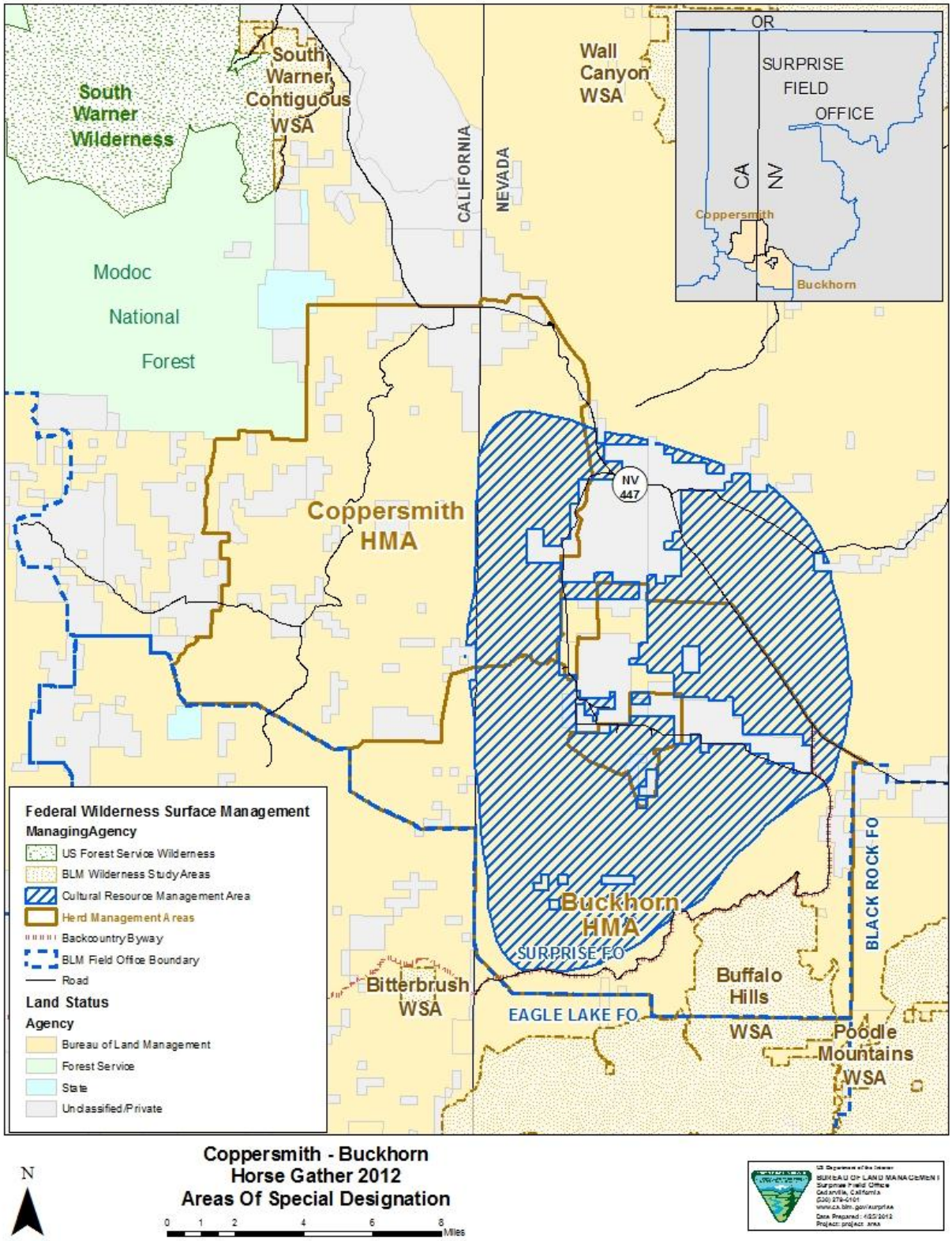
The Buckhorn and Coppersmith HMAs are within the area traditionally used by the Northern Paiute or Paviotso. The northern portion of the area falls within the area identified as being used by the Agaipaninadokado (fish lake eaters), Moadokado (wild onion eaters) of Summit Lake, and the Gidutidad (groundhog eaters) of Surprise Valley. The southern portion lies within the area traditionally used by the Kamodokado (jack rabbit eaters) of Gerlach, Nevada. The Kamodokado area reportedly included the territory that others did not claim. The area of the Sawadokado (sagebrush mountain dwellers) of Winnemucca also extends into the southwest portion of the area. Paiutes from other areas likely passed through on their way to fish at Summit Lake or to hunt.

The Northern Paiute were hunting-gathering bands that generally traveled seasonal rounds in small family groups subsisting on a variety of plant foods, insects, small game, and fish. Game animals available to Native Americans in the planning area included antelope, rabbits, bighorn sheep, mule deer, and a variety of small mammals, reptiles, and birds. Lahontan cutthroat trout was procured at nearby Summit Lake. Lahontan cutthroat trout, as well as cui ui (a large plankton-feeding fish (tui chub) that occurs only at Pyramid Lake), were also available at Pyramid Lake south of the Black Rock Desert. Antelope and rabbits were often hunted communally. Seeds and roots were the primary plant foods gathered. Plant and animal products were also used for clothing, shelter, and other functional and ceremonial articles. Medicinal plants were used for healing purposes.

Lithic sources provided materials for tool manufacture. Some minerals were also used medicinally and ceremonially. A more complete summary of the plants and animals used by the Northern Paiute that occur in and near the management area, as well as other ethnographic information, is provided in Lohse (1981).

The Tuledad/Duck Flat Cultural Resource Management Area is located within the two HMAs (see Map 2). This area was designated in 2008 as a result of the high density of cultural resource sites along with natural resource values. Of the 360 archaeological sites located in the HMAs 69% (250 sites) are located within the Tuledad/Duck Flat Cultural Resource Management Area.

Map 2. Areas of Special Designation within the Buckhorn and Coppersmith HMAs



Class II and III cultural resource inventories have been conducted within the Buckhorn and Coppersmith HMA Gather Area since the 1970s. The archaeological inventories have covered 16.2% of the HMAs and resulted in the recordation of 360 previously unidentified archaeological sites. The types of sites represented within the project area are tool- stone quarries and reduction areas; prehistoric camp sites, which include rock features; rockshelters/caves; historic homesteads and refuse scatters; hunting blinds; and petroglyphs. Although very few of the cultural resource sites have been formally evaluated for their eligibility to the National Register of Historic Places (NRHP), many of the sites appear to have elements which qualify them as eligible to the NRHP under criterion d (the site contains information that will contribute to our understanding of human history or prehistory). Because a formal determination of National Register eligibility has not been made for most of the sites, the Bureau of Land Management assumes that all sites are eligible.

The most sensitive areas for cultural resources are those which have natural water sources, such as springs and streams. Heavy historical livestock grazing (pre-1970s) severely impacted and damaged many cultural sites. Lithic scatters (reduction areas), village sites, and quarry sites are especially vulnerable because trampling can break up, displace, and destroy artifacts. Sites damaged by livestock or wild horse grazing begin to erode and can lose their integrity until they are eventually completely destroyed. Natural water sources that have been developed with spring boxes, pipes, and troughs have had and have the potential to impact cultural sites.

The Surprise Field Office regularly consults with the Fort Bidwell Tribal Council, Cedarville Rancheria Tribal Council, and the Summit Lake Tribal Council about projects within the Surprise Field Office boundaries. To date there have been no concerns expressed about horse gathers.

3.5 Livestock Grazing

Information on livestock grazing is provided in this document to provide basic information on how land health within the Buckhorn and Coppersmith HMAs is being affected by multiple uses of the land, including the livestock grazing permits. Making adjustments to livestock grazing permits is outside of the scope of this environmental assessment, however, documentation and authorization for the livestock grazing permits can be found within the documents listed in this section and in Section 1.7.

Livestock grazing within the Buckhorn and Coppersmith HMAs is managed for cattle within the Tuledad Allotment. This allotment is divided into North and South pastures, which are further divided by separate use areas. The Buckhorn HMA occurs in the South Pasture, and the Coppersmith HMA occurs in the North Pasture. There are seven grazing permittees who are authorized up to 9,591 Animal Unit Months (AUMs) annually during a six-month season of use (April 1 to September 30). Cattle and sheep are rotated through nine use areas and distributed to stay within the carrying capacity of each of the two pastures.

The Buckhorn and Coppersmith HMAs are located entirely within the Tuledad Allotment as shown on Map 3 and in Table 3.5.1 below. However the allotment acreage cannot be compared directly with the size of the HMAs, as these areas do not share identical boundaries. HMA

boundaries were established under the *Wild Free-Roaming Horses and Burros Act of 1971* (as amended), and were created within areas where wild horses were located in the 1970s. Livestock grazing allotment boundaries are based on fencelines and natural boundaries, and have been adjusted over the years based on agreements and the original rangeland adjudications following enactment of the Taylor Grazing Act. The allotment boundaries are identified through Land Use Plans and local permit authorizations.

Most livestock grazing allotments include both public BLM-administered lands and private lands. The private lands are included in the allotment acreage if they are not fenced, and are used in common with the public lands. In many cases, the private lands contain important drinking water sources that are available for livestock, wild horses and wildlife. The private lands are generally owned by the grazing permittee for that allotment.

Table 3.5.1 Livestock Grazing Allotments within the Buckhorn and Coppersmith HMAs

Livestock Grazing Allotment Name	HMA Name	Total Allotment Size (acres)	Percent of Allotment located within HMA
Tuledad	Buckhorn	160,400	50%
Tuledad	Coppersmith	160,400	50%

Current Livestock Management

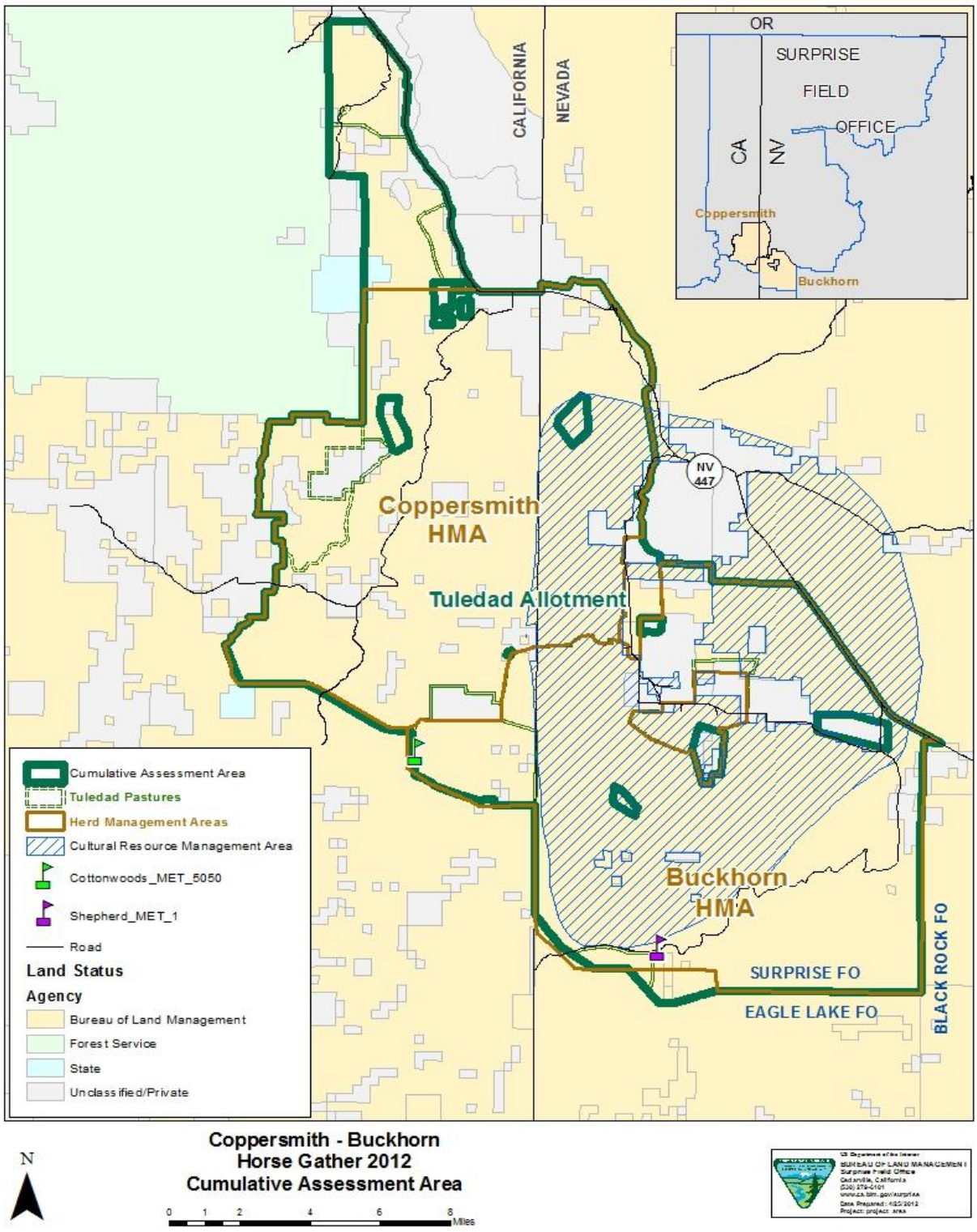
The management of cattle and sheep in the Buckhorn and Coppersmith HMAs is subject to the Tuledad Allotment grazing permit stipulations, particularly regarding livestock numbers and season-of-use restrictions.

Recent decisions pertaining to the Tuledad Allotment are contained in the following documents:

1. Tuledad Fuels Reduction and Habitat Restoration Project, 2009
2. Surprise Resource Management Plan and Record of Decision, 2008
3. Tuledad Allotment Grazing strategy and Related Projects, 1998

Livestock grazing use is managed with fencing, herding, and strategic placement of water. Rest-rotation grazing and/or deferred rotational grazing is also employed. Under rest rotation grazing, a pasture is grazed for one season, and then is rested for one or two growing seasons to allow grazed plants to recover vigor and root mass prior to subsequent grazing. Deferred grazing involves postponing grazing on a pasture until a specific period of time; for example, when plants mature and reach seed set, they are not as vulnerable to damage from grazing as they would be during spring growth. Other grazing strategies include early-on and early-off grazing, altering turnout locations, delayed turnout, or a modified annual season-of-use. Annual adjustments to livestock grazing are made by the BLM according to forage availability and in response to drought conditions or above-average precipitation.

Map 3. Livestock Grazing Allotments and Cumulative Assessment Area for the Buckhorn and Coppersmith HMAs



In general one of the primary purposes of rest, deferment or delayed turnout (and other changes of the grazing period) is to reduce the intensity, duration and frequency of grazing on native grass species during the critical growth period for native grass species. The critical growth period occurs during the spring and early summer (depending on grass species, topography, elevation and soils) when these plants are actively growing, through the period when they set seed.

Livestock Use

There are a total of seven livestock permits that are currently authorized to graze livestock in the two allotments annually. The operators are authorized to use 9,502 Animal Unit Months (AUMs) of forage each year (2,354 AUMs for cattle and 7,156 AUMs for sheep). An AUM is the amount of forage needed to sustain one cow and her calf or a bull (or one wild horse plus foal) for a month. This is roughly equivalent to 1,000 pounds of forage. Table 3.5.2 below lists the maximum number of animals and animal unit months that are permitted in each grazing allotment for cattle, along with the permitted season of use, and the type of grazing system employed.

Table 3.5.2 Authorized Cattle Grazing Use within the Buckhorn and Coppersmith HMAs

Livestock Grazing Allotment Name	Number of Permits	Livestock Numbers[1/]	Authorized Season of Use	Permitted Livestock AUMs	Grazing System
Tuledad	7	4,000 sheep	03/26 – 06/30; 09/20 – 10/15	2,354	Lower elevations are used for lambing in the spring, and then sheep trail through the summer ranges, and are taken off the allotment by mid-July. Sheep are trailed back through the allotment during September and early October.
		1,412 cattle	04/01 – 09/30	7,156	Two pasture deferred rotation grazing system, and nine use areas with specific grazing seasons of use, and resource objectives.

[1/] Livestock numbers are for the entire grazing allotment, and do not reflect the AUMs that would be allocated within each HMA, as only a portion of the grazing allotments will fall within an HMA. Livestock are only allowed in the allotments for the prescribed period of use, not the entire year.

Livestock Grazing Objectives

The primary management objectives for livestock grazing on BLM-administered lands within the Buckhorn and Coppersmith HMAs as defined in prior decisions are to:

- Provide a sustainable level of livestock forage that is consistent with achieving BLM land health standards, objectives for other resources, and multiple-use management of public

lands.

- Maintain and improve rangeland productivity by implementing a grazing system which allows a pasture (a different one each year) to receive rest from livestock grazing during the critical growth period for native grass species.
- Implement a grazing system which allows riparian areas to rest in the growing season, and maintain riparian areas in "Proper Functioning Condition" (PFC). Protect riparian areas and springs that are not in PFC through fencing and other improvements.
- Protect, maintain and enhance habitat for wildlife, with an emphasis on protecting designated important habitats (e.g. sage-grouse) and riparian/wetland sites.

Changes to Livestock Grazing Permits

All livestock permits within the Buckhorn and Coppersmith HMAs have undergone changes to permit terms and conditions over the past decades. In the 1960's a rangeland forage inventory was completed and the results used to establish a carrying capacity which adjudicated active permitted use levels for the Tuledad Allotment. This adjudication was fully implemented in the early 1970's and resulted in a 58% reduction in permitted use levels for the Tuledad Allotment.

In the 1980 an allotment management plan (AMP) was developed which implemented various range projects, and established use areas and pastures based primarily on elevation, soils and vegetation communities. An evaluation of the AMP was completed in 1991, and indicated that upland perennial grasses were generally improving, while improvement to riparian conditions continued to be mixed, and bitterbrush stands were generally being replaced by bunchgrasses and other shrubs. During the 1990's several grazing decisions were issued on a 1-2 year basis to address potential livestock impacts on specific habitats such aspen, bitterbrush and riparian communities.

Following extensive consultation and litigation with variously interested publics, agencies, a Technical Review Team (TRT) was developed in the late 1990's to review resource issues and evaluate the allotment. The TRT identified appropriate issues to be resolved and the alternatives were carried forward in 1999 grazing decision. Since this decision was issued, the BLM has monitored resource objectives, and conducted land health assessments and utilization studies to determine if current management activities are meeting allotment resource objectives, including compliance with Land Health Standards. The BLM generally issues grazing permit renewals on a ten-year basis, but will make adjustments as necessary to the number of animals, AUMs, grazing systems, season of use, or other livestock grazing practices to ensure that the allotments are meeting land health standards.

Active Use and Actual Use

Active use means the AUMs available for livestock grazing use under a permit or lease based on livestock carrying capacity and resource condition in an allotment, also referred to as active permitted use.

Actual use of an allotment is the number of livestock (or horses) that were actually grazed during

a given grazing year, the length of time and season that they grazed, and the amount of forage harvested (AUMs).

Between 2009 and 2011 cattle *actual use* has averaged 64% of permitted use, and sheep *actual use* has averaged 100% of permitted use. This is due to several factors: limited availability of water sources; climate conditions (including drought); and the operational needs of individual permittees. Table 3.5.3 below lists the actual use AUMs for cattle and sheep that were grazed in the Tuledad Allotment between 2009 and 2011.

Table 3.5.3 Cattle and Sheep Grazing *Actual Use* of the Tuledad Allotment from 2009 to 2011

Type of Livestock	Actual Use 2009 - 2011 (Average AUMs)	Permitted Use (AUMs)	Percent of Permitted Use
Cattle	4,578	7,156	64%
Sheep	2,551	2,354	108%

Table 3.5.3 above shows that the 3-year average of *actual use* AUMs for cattle grazing in the allotment is 4,578 AUMs, which is 64% of the total permitted AUMs (7,156). The 3-year average of *actual use* AUMs for sheep grazing in the allotment is 2,551 AUMs, which is 108% of the total permitted AUMs (2,354). The average *actual use* for all livestock grazing in the Tuledad Allotment over the past 3 years has been 7,282 AUMs, which is 77% of the total permitted AUMs (9,510).

Comparison of Actual Use between Cattle and Wild Horses

Actual use often is much less than permitted or active use specified on grazing permits, due to various circumstances, as shown in the tables above. For this reason, it is important to compare the *actual use* of cattle to the *actual use* of wild horses to get a clearer idea of how these animals actually have used the Buckhorn and Coppersmith HMAs over the past three years. Livestock numbers vary each year, but the actual use of livestock within the Buckhorn and Coppersmith HMAs has generally been below the active use for the past three years. On average over the past three year period, actual use has been 72% of the active use for livestock.

Wild horses in the Buckhorn and Coppersmith HMAs have approximately a 17 to 23% annual recruitment rate from foaling, have a high (92-95%) annual survival rate, and there is some documented movement between other HMAs, resulting in herd numbers increasing between gathers. These population increases have also resulted in movement of wild horses to areas outside but adjacent to the HMAs.

Actual use by wild horses is calculated on an AUM basis. This is determined by multiplying the number of wild horses counted during the population inventory by 1 AUM and by 12 months (grazing period). One adult wild horse, or one mare and foal less than 6 months of age are counted as 1 AUM. Table 3.5.4 lists the *actual use* of wild horses in the Buckhorn and Coppersmith HMAs for the past three years, based on the wild horse population for the listed

years. The table also lists the actual use for cattle and sheep in the Tuledad Allotment during this time.

Table 3.5.4 *Actual Use* by Wild Horses and Cattle in the Buckhorn and Coppersmith HMAs, 2009 to 2012

Animal Type	Actual Use – Animal Unit Months by Year	
	AUMs	Percent of Permitted or Allocated AUMs
Wild Horses – Buckhorn HMA	2,196	215%
Wild Horses – Coppersmith HMA	1,224	136%
Wild Horses – Total	3,420 1/	178%
Cattle	4,578	64%
Sheep	2551	108%

1/ Calculated from average numbers of wild horses in the Buckhorn and Coppersmith HMAs from 2009 through 2012. See Figures 3.2 and 3.3, and Table 3.3.8.

3.6 Noxious Weeds and Invasive Species

Surveys for noxious weeds and invasive species are conducted annually on BLM administered land in the Surprise Field Office. All new noxious weed occurrences are incorporated into the integrated weed management plan for annual treatments and monitoring. In the Buckhorn HMA there are 16 noxious weed sites that are infested with perennial pepperweed, medusahead, hoary cress, scotch thistle, Canada thistle, and Russian knapweed. In the Coppersmith HMA there are approximately 46 noxious weed sites that contain perennial pepperweed, medusahead, hoary cress, scotch thistle, yellow star-thistle, and Russian knapweed. The following table outlines the noxious weeds known to occur, the number of infestations, and the total acreage.

Table 3.6 Infestations of Noxious Weeds and Invasive Species within the Buckhorn and Coppersmith HMAs

HMA(s)	Common Name	Scientific Name	Number of Infestations	Total Acres Infested
Buckhorn	Canada Thistle	*Cirsium arvense*	5	< 0.5
Coppersmith	Yellow Starthistle	*Centaurea solstitialis*	1	< 0.1
Buckhorn/Coppersmith	Medusahead	*Taeniatherum caput-medusae*	3	< 185.0
Buckhorn/Coppersmith	Halogeton	*Halogeton glomeratus*	2	< 0.2
Buckhorn/Coppersmith	Hoary Cress	*Cardaria draba*	5	< 0.5

HMA(s)	Common Name	Scientific Name	Number of Infestations	Total Acres Infested
Buckhorn/Coppersmith	Perennial Pepperweed	*Lepidium latifolium*	25	< 2.5
Buckhorn/Coppersmith	Scotch Thistle/	*Onopordum acanthium*	27	< 2.7
Buckhorn/Coppersmith	Russian Knapweed	*Acroptilon repens*	7	< 0.7
Buckhorn/Coppersmith	Cheatgrass	*Bromus tectorum*	Localized [1/]	Unknown

[1/] Cheatgrass is an annual invasive grass that occurs locally in some areas of the HMAs. The range and density of cheatgrass is widespread throughout the landscape, but represents only a small percentage of the plant community population as a whole.

The BLM is actively treating sites of Scotch thistle, Russian knapweed, and yellow starthistle. With a few exceptions, these populations are associated with heavily disturbed areas along roads, stock water areas, and riparian zones. All known populations have been treated and follow up monitoring is ongoing.

The presence of heavily traveled routes (Buckhorn Road, NV 447 Highway, and the Tuledad Road), both within and adjacent to the HMAs, increases the risk of populations of noxious weeds becoming established in the area. Vehicles and heavy equipment traveling on these routes, and crossing the associated drainages, may increase the likelihood of additional noxious weed infestations, including Dyer's wood and Mediterranean sage becoming established in the HMAs in the near future. In addition, the populations of hoary cress are increasing along jeep trails, road corridors, ephemeral drainages, and in campsites.

3.7 Riparian and Wetland Sites

The BLM evaluated the condition and health of riparian and wetland sites in the Buckhorn and Coppersmith HMAs using Riparian Functional Assessments in 2009 and 2010. These assessments were made as part of the livestock grazing permit renewal process for the Tuledad Allotment which contains riparian and wetland sites. The information presented below is therefore presented by grazing allotment, rather than by HMA.

Riparian Functional Assessments are utilized as a qualitative method for assessing the condition of riparian and wetland areas. The term "Proper Functioning Condition" (PFC) is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian area. The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian area to hold together during high flow events with a high degree of reliability. Two types of riparian and wetland areas exist within the Buckhorn and Coppersmith HMAs: lotic and lentic. Lotic systems are associated with flowing streams, while lentic systems are associated with meadows, lakes and wetlands. The assessment of these sites was done following the guidance and checklist provided in BLM Technical References 1737-15 (Lotic systems) and 1737-16 (Lentic systems).

Riparian and wetland sites within the Buckhorn and Coppersmith HMAs are generally small (less than 1 acre) and are capable of only providing water for a limited number of wild horses, livestock, and/or wildlife. A few larger springs with meadow complexes exist within the HMAs, and these sites are typically heavily utilized by livestock and wild horses due to the amount of green riparian vegetation available during the hot summer months, when adjacent upland vegetation becomes mature and dry and loses nutritional value. During drought years, and in years with less than average precipitation, many of these riparian areas are unable to store any water past spring or early summer. Therefore many riparian/wetland areas are not capable of providing *any* water for *any* species during a drought.

As a result of having many water sources dry up during a drought season, larger riparian systems receive a disproportionate amount of use. This often leads to riparian systems becoming degraded from the high amounts of utilization and soil alteration that occurs from a concentrated number of animals using limited perennial water sources. If drought conditions persist, or animal numbers are not reduced, these riparian areas will continue to degrade and eventually become dewatered, providing less water in subsequent years. It is the policy of the Surprise Field Office BLM to assess both perennial and intermittent water sources to identity those water sources that may become dry and those that will then subsequently receive heavier use.

A few riparian and wetland sites in the Buckhorn and Coppersmith HMAs have made progress towards being rated as "Proper Functioning Condition" (17%) over the past 20 years; however the majority of riparian areas within the HMAs are rated as either "Functional at Risk" (79%) or "Nonfunctional" (4%), as listed in Tables 3.7.1, 3.7.2, and Figure 3.7 below. Many sites have been rated as having a "downward trend" and are at risk of becoming more severely degraded if current impacts and use by wild horses are not reduced.

Improvements in riparian function that have occurred in recent years can be attributed to changes in livestock grazing management. These include restricting grazing to certain periods each year, setting utilization limits on either herbaceous or woody vegetation, providing for more intensive pasture rotations, and avoiding excessive use during the hot season. In addition, several riparian sites within the HMAs have been fenced out from grazing in areas where livestock and wild horses naturally congregate in large numbers. The construction of additional water developments, and changing the salting patterns of livestock away from riparian areas have also contributed to improvements in some areas.

Table 3.7.1 Summary of Riparian Functional Assessment Ratings – Tuledad Allotment (Buckhorn and Coppersmith HMAs)

Grazing Allotment	Riparian Functional Assessment Rating [1/]		
	Proper Functioning Condition (No. of Sites)	Functional - At Risk (No. of Sites)	Nonfunctional (No. of Sites)
Tuledad Allotment	4	18	1

[1/] Source: BLM Technical Reference 1737-15. Definitions:

"Proper Functioning Condition: Riparian-wetland areas are functioning properly when adequate vegetation,

landform, or large woody debris is present to dissipate stream energy associated with high flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity.

Functional - At Risk: Riparian-wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Nonfunctional: Riparian-wetland areas that are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, etc., as listed above. "

Table 3.7.2 Riparian/Wetland Functional Assessment Ratings within the Tuledad Allotment

Site Name	Spring Developed Yes/No	RFA Rating	Trend	Type of Impact	Comments
Bird Bath Spring (Inside Exclosure)	Yes	PFC	N/A	None	Exclosure
Ant Spring (Inside Exclosure)	Yes	PFC	N/A	None	Exclosure
Unnamed	No	PFC	N/A	Cattle and Wild Horses	Trampling
Snake Lake Riparian	Stream	PFC	N/A	None	No bare ground
Bare Creek Exclosure	Stream	FAR	Not Apparent	Cattle and Wild Horses	Road along one side of riparian
Worland Drainage/ Riparian	Stream	FAR	Not Apparent	Cattle and Wild Horses	Banks fully vegetated
3 South of Boot Lake	Yes	FAR	Not Apparent	Cattle and Wild Horses	Headcutting and hummocking of soils
Pryor Spring	Yes	FAR	Not Apparent	Cattle, Wild Horses, and Road Development	Upper part of riparian area is broken up by the road
Below Apple Orchard #1	No	FAR	Not Apparent	Cattle and Wild Horses	Hummocking; nick point at the top of the spring
North of Orchard #1	No	FAR	Not Apparent	Cattle	Riparian area would likely be wider if no hoof action
Orchard Spring (Outside of Exclosure)	No	FAR	Not Apparent	Cattle, Wild Horses, and Road Development	Hoof action is impacting water spread
West of Willow Lake	No	FAR	Not Apparent	Cattle and Wild Horses	Severe hoof action altering the flow of water
Below Apple Orchard #2	No	FAR	Not Apparent	Cattle and Wild Horses	Downcutting of channel
Rowland Spring	No	FAR	Not Apparent	Cattle, Wild Horses, and Domestic Sheep	Sagebrush invading in riparian

Site Name	Spring Developed Yes/No	RFA Rating	Trend	Type of Impact	Comments
Garden Lake #3	No	FAR	Downward	Cattle and Wild Horses	Some bank cutting; Sage-grouse droppings present
SE Garden Lake #2	No	FAR	Downward	Cattle and Wild Horses	Many areas void of vegetation
Chalk Hill Spring	Yes	FAR	Downward	Cattle and Wild Horses	Sagebrush encroaching
SE of Garden Lake #1	Yes	FAR	Downward	Cattle and Wild Horses	Heavy hoof action
Sandstone Spring	Yes	FAR	Downward	Wild Horses	Very rocky/sparse vegetation
Unnamed Spring NE of Runyun Spring	Yes	FAR	Downward	Cattle and Wild Horses	Excessive bare ground and hummocking
W. of Cabin #2	Yes	FAR	Downward	Cattle and Wild Horses	Spring has been dugout
Above Orchard Spring #2	No	FAR	Downward	Cattle and Wild Horses	Nick point and cutting
Orchard Springs Lower @ Road	No	NF	N/A	Cattle, Wild Horses, and Road Development	Excessive bare ground

Condition of Riparian/Wetland Sites within the Tuledad Allotment - Coppersmith HMA

The majority of the Coppersmith HMA occurs within the Duck Flat and Lower Alkali Lake watershed and drains north and east into Duck Flat. One small portion of the Coppersmith HMA (Boot Lake, on the extreme west side of the HMA) is in the Madeline Plains watershed and drains south into Dodge Reservoir.

Most springs throughout the HMA show heavy past and current livestock and horse use. Many springs are developed for livestock water. These developments generally occur on smaller springs, and many have exclosures built around a spring or headbox and the water is piped off site to a trough. There are several exclosures that have been built to protect larger riparian resources including Bud Brown (506 acres), Lower Ant Spring (14 acres), and Nova Spring (8 acres). Water quality within the HMA is generally adequate for the identified benefit of livestock, wildlife, and wild horse water.

In the HMA, wild horses tend to prefer ephemeral lakes and reservoirs in the open areas, not within the juniper woodland thickets. Water supply is not ordinarily a limiting factor for wild horses in the HMA. However, on dry years, the lakes, reservoirs, and some of the seeps and springs go dry and wild horses tend to concentrate on a limited number of perennial watering sites. During these drier periods, many riparian areas that contain perennial water are used yearlong by wild horses and by cattle during the authorized use periods. This has led to many riparian areas experiencing heavy utilization levels, mechanical alteration of riparian soils, soil erosion and hummocking. Additionally, during drier periods some smaller springs have excessive use that leads to dewatering and lose of water holding capacity within the riparian zone

from the factors discussed above. This problem represents a long term reduction in the quantity and quality of riparian resources. This problem is exasperated during periods of time when wild horse numbers are above AML, which contributes to long term degradation of riparian resources.

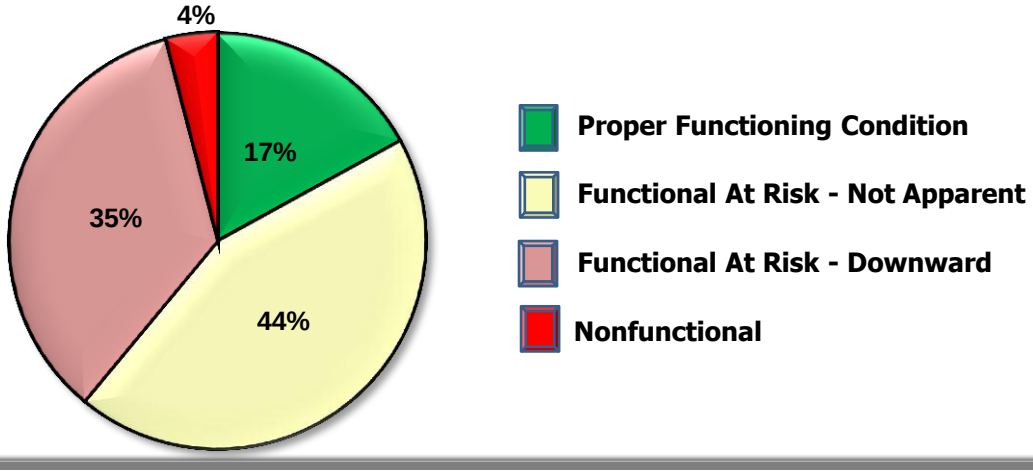
Condition of Riparian/Wetland Sites within the Tuledad Allotment - Buckhorn HMA

The majority of the Buckhorn HMA occurs within the Duck Flat watershed, which includes several ephemeral lakes or depressions, including Duck Flat. There is a small area south of the Buckhorn HMA (Rowland Spring in the extreme south and the Buffalo Hills on the extreme southeast corner of the HMA) that includes the Smoke Creek Desert watershed. There is also a small area around SOB Lake and to the southwest that is in the Madeline Plains watershed.

Generally, water supply is not a limiting factor for wild horses in the Buckhorn HMA, except during drought years when ephemeral lakes, reservoirs and small springs will go dry. There are several perennial creeks scattered across this HMA that are used by wild horses. These water sources and associated riparian areas occur on both private and public lands. Based on the past Rangeland Health Assessment, water quality within the HMA is generally adequate for the benefit of livestock, wildlife, and wild horse water.

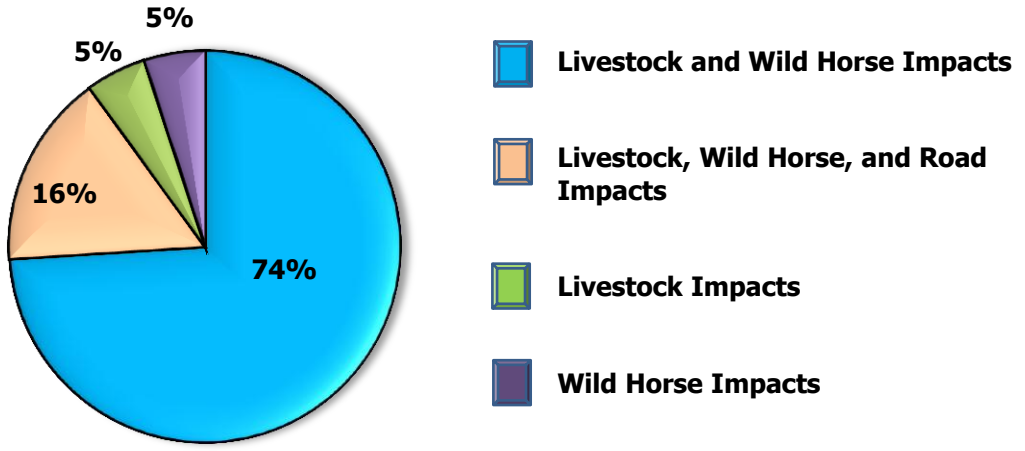
Most springs throughout the HMA show heavy past and current livestock and horse use. Additionally, at many springs the natural hydrology has been modified by development for livestock water that changes the ability of the system to function as a naturally occurring wetland/riparian area. On dry years, the lakes, reservoirs, and some of the seeps and springs go dry and wild horses tend to concentrate on a limited number of perennial watering sites. During these drier periods, many riparian areas that contain perennial water are used yearlong by wild horses and by cattle during the authorized use periods. This has led to many riparian areas experiencing heavy utilization levels, mechanical alteration of riparian soils, soil erosion and hummocking. Additionally, during drier periods some smaller springs have excessive use that leads to dewatering and lose of water holding capacity within the riparian zone from the factors discussed above. This problem represents a long term reduction in the quantity and quality of riparian resources. This problem is exasperated during periods of time when wild horse numbers are above AML, which contributes to long term degradation of riparian resources.

Figure 3.7 Tuledad Allotment - Summary of Riparian/Wetland Functional Assessment Ratings



The predominant causal factors for all riparian or wetland sites in the Buckhorn and Coppersmith HMAs that are not in Proper Functioning Condition include impacts from livestock and wild horse grazing, combined or separately, and roads, as shown in Figure 3.8. In many cases the BLM site observer for land health assessments will only record whether the site has been disturbed by any type of grazing, and makes no distinction as to the type of animal. Where the BLM records use or trampling by wild horses on data forms, this is because it is visibly obvious that the use has been by wild horses. Effects on vegetation from utilization or trampling by either wild horses or livestock are typically evident by the presence of animals at a site, the presence and kind of hoof prints, the presence and type of manure (e.g. stud piles), the presence and type of rolling or wallowing areas, and the timing of the use or disturbance (since livestock are limited to allotments by specific grazing periods).

Figure 3.8 Tuledad Allotment - Predominant Causal Factors for Riparian/Wetland Sites Rating "Functional At Risk" or "Nonfunctional"



3.8 Soil Resources

Soils within the Buckhorn and Coppersmith HMAs are generally stable and exhibit properties appropriate for the soil type (i.e. infiltration rate, permeability, and chemical characteristics). Impacts to soils include historic (pre-1970) livestock grazing. The loss of herbaceous cover and change in plant composition has had impacts upon soils within the allotment. Soils within riparian areas and wetlands are extremely vulnerable to trampling by livestock and wild horses. Soil information for the HMAs is based on the Surprise Valley/Home Camp Soil Survey, CA #685/NV#617. This soil survey was updated in 2006 by the Natural Resources Conservation Service (NRCS) Reno State Office to meet current standards. This survey is available on the NRCS soil survey web site: http://websoilsurvey.nrcs.usda.gov.

There are a total of five trap sites and one short term holding facilities proposed for the gather (see Map 1). They cover a total of 14 different soil mapping units. These soils range from gravelly fine sandy loam to very cobbly and very stony loams. Slopes vary from 0-50%, with most being within the 4-30% slope range.

Soils – Buckhorn and Coppersmith HMAs

The major landforms in the project area are mountains, mountain shoulders, summits and plateaus. Parent material is mainly volcanic ash and colluviums derived from volcanic rock. In general the soils vary in depth from shallow to deep and are well drained. The soils vary in texture from a very ashy sandy loam soil up on the Cottonwood Mountain, to an extremely cobbly ashy loam soil on the Coppersmith Hills. The following is a summary of the most common soil mapping units and ecological sites; they are grouped by dominate vegetative type.

Big Sagebrush Vegetative Type

Typical vegetation of these ecological sites consists of bluebunch wheatgrass, Cusick's bluegrass, mountain big sagebrush, Idaho fescue, needlegrass, Basin wildrye, antelope bitterbrush, and perennial forbs.

Soil Mapping Units (SMU) include:

#338 Cavin-Nutzan-Snag Association;

#418 Harskel-Menbo Association;

#420 Hart Camp-Menbo Association;

#533 Redhome-Cowbell Association ;

#477 Ninemile-Madeline-Crocan Association.

Predominant Ecological sites are:

R023XY061NV - Mountain Shoulders 14-18" P.Z;

R023XY066NV - Ashy Loam 14-16" P.Z;

R023XY019NV - Loamy 16+" P.Z.

R023XY016NV - South Slope 12-16" P.Z.

R023XY041NV - Loamy 12-14" P.Z.

R023XY015NV - Stony Loam 12-14" P.Z.

R023XY007NV - Loamy 14-16" P.Z.

Low Sagebrush Vegetative Type

Typical vegetation on these sites consists of bluebunch wheatgrass, low sagebrush, Thurber's needlegrass, bluegrass, and several perennial forbs.

Soil Mapping Units (SMU) include:

#368 - Devada-Dosie-Softscrabble association

#476 - Ninemile-Karlo-Crocan association

Predominant Ecological sites are:

R023XY031NV - Claypan 10-14" P.Z.

R023XY017NV - Claypan 14-16" P.Z.

Washoe Rubber Rabbitbrush Vegetative Type

Typical vegetation on this site consists of Sandberg's bluegrass, bottlebrush squirreltail, perennial forbs, low sagebrush, and Washoe rubber rabbitbrush.

The predominant Ecological Site is:

R023XY001NV - Churning Clay 10-14" P.Z.

Western Juniper Woodland Vegetative Type

Typical vegetation consists of western juniper, with an understory of Idaho fescue, perennial grasses including Canby's bluegrass, Cusick's bluegrass, Thurber's needlegrass, western needlegrass, bluebunch wheatgrass, and mountain sagebrush.

The predominant Ecological Site is:

F023XY095NV – JUOC WSG: OR2003.

Mahogany Savanna Vegetative Type

Typical vegetation consists of Curlleaf mountain mahogany, Cusick's bluegrass, bluebunch wheatgrass, Idaho fescue, needlegrass, and mountain big sagebrush.

The predominant Ecological Site is:

R023XY026NV - Mahogany Savanna.

Microbiotic Soil Crusts

The soil surface community includes cyanobacteria, green algae, lichens, mosses, microfungi and other bacteria. Soils with these organisms are often referred to as cryptogamic soils and form what are known as biological crusts. The cyanobacteria and microfungal filaments aid in holding loose soil particles together forming a biological crust which stabilizes and protects soil surfaces. Bryophytes (mosses and liverworts) are the most prevalent in the allotment. The biological crusts benefit soils by increasing moisture retention, fix nitrogen, and may discourage the growth of annual weeds. Most biological crust organisms make their growth during cool moist conditions. However, mountain and low sagebrush types often lack substantial biological (soil) crust cover due to dense vascular vegetation and accumulating plant litter.

There are several reasons for decreases in soil crust which include extensive livestock and wild horse grazing, wildfires, and more recently off-road vehicle use. In addition, the reason for limited soil crust is inversely related to vascular plant cover. The distribution, shape, and height of vascular plants can either increase or decrease soil crust or influence crust species composition. Vascular vegetation reduces the overall soil surface available for colonization.

3.9 Special Status Plants

Special status species that occur within the herd management areas include those terrestrial species listed or proposed for listing under the Endangered Species Act, species designated by the USFWS and candidates for listing. There are no known populations of federally listed Endangered, Threatened, Proposed, or Candidate plant species in any of the two HMAs. However, one California sensitive species, Schoolcraft's cryptantha (*Cryptantha schoolcraftii*) occurs in the Coppersmith HMA on very dry, nearly barren soils in Tuledad Canyon and south of Duck Lake.

Table 3.9 Special Status Plants within the Coppersmith HMA

Plant Name Scientific/ Common	Status[1/]	Locations[2/]	Habitat	Threats
Cryptantha schoolcraftii Schoolcraft's cryptantha Boraginaceae CRSC3	G3Q/NV S3 NNPS W	Tuledad Canyon; C	White ashy barren outcrops in sage-brush scrub hills.	None at present. Potential impacts from OHV and mining.

[1/] Status refers to federal and state element ranking (Natureserve) and CA or NV Native Plant Society rarity rankings. California source: California Natural Diversity Data Base (CNDDB), CA Dept of Fish & Game July 2007.

G3Q = Vulnerable — At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors. The element is very rare, but there are taxonomic questions associated with it.

NVS3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

NNPS = Nevada Native Plant Society, 2007 list; NNPS W = NV watch species, (Nevada Natural Heritage Program, 2007; see http://heritage.nv.gov/spelists.htm).

[2/] Locations and number of known occurrences on BLM lands. C for confirmed, or S for suspected.

There is no information that suggests grazing is impacting this species. The largest site of Schoolcraft's cryptantha in the HMA is fenced and excluded from grazing. Prior to setting up gather facilities, the BLM will inventory trap sites for sensitive species to ensure they will not be impacted.

3.10 Upland Vegetation and Land Health Assessments

The Surprise Field Office Resource Management Plan (RMP) and Record of Decision of April 2008 adopted the Northeastern California and Northwestern Nevada, Standards for Rangeland (Land) Health and Guidelines for Livestock Grazing Management of July 2000. Land Health Assessments were conducted in the Tuledad Allotment between 1999 and 2004. The information presented below is therefore presented by grazing allotment, rather than by HMA. NRCS Ecological Sites were used as the reference sites (called for in Pellant *et al*., 2000). The two standards that are used to evaluate resource conditions of upland vegetation are: (1) Upland Soils, and (2) Biodiversity. See Appendix E for a complete description of land health assessment methodology. Seventeen upland health indicators were rated in each assessment area, based on the departure from potential for the site. The potential is based on ecological site descriptions and reference sheets developed for major ecological sites.

Tuledad Allotment – Upland Vegetation and Land Health Assessments

The lowest elevations (below 5,500 feet) in the Buckhorn and Coppersmith HMAs occur on the eastern and northern edges around Surprise Valley, Duck Lake Valley and Tuledad Canyon. Duck Lake is a dry lake bed on partly private lands, fenced, irrigated, and used for hay production. These areas are primarily deep loamy soils that support basin and Wyoming big sagebrush/Thurber's needlegrass dominated communities on the slopes, and alkali tolerant greasewood and saltgrass dominated communities on the lake flats. Wild horses often winter along the southern and eastern slopes of Duck Lake Valley when the higher elevations are snow covered.

The mid elevations (5,500 to 6,800 feet) occupy the largest portion of the HMAs. These areas are loams and clay loams that support a complex mosaic of mountain big sagebrush/Idaho fescue/bluebunch wheatgrass/Thurber's needlegrass, low sagebrush/Sandberg's bluegrass, and western juniper dominated communities. There are small areas of heavy clay soils that contain rabbitbrush communities, ephemeral lakebeds with silver sagebrush and herbaceous dominated communities, mountain rims with mountain mahogany, and a few small stands of quaking aspen. Wild horses spend the majority of the year at these elevations, from early spring to late fall, and they often winter on these sites during warm and open winters.

The highest elevations of the HMA (6,800-8,000 feet) are limited to the upper reaches of Cottonwood Mountain and the steep slopes on the east side of the Warner Mountains. The soils on these elevations support productive communities of mountain big sagebrush and low sagebrush interspersed with mountain brush components such as bitterbrush, serviceberry,

chokecherry, bittercherry, oceanspray, snowbrush, and mountain mahogany. Some forest species (white fir and ponderosa pine) and aspen stands are also found at these elevations. The majority of the drainages and springs in the HMAs support herbaceous plant communities including grasses, forbs, sedges, and rushes. Many of these systems also contain some woody riparian vegetation including willow, rose, aspen, and chokecherry.

Summary of Upland Vegetation and Land Health Assessments

The BLM completed land health assessments (LHAs) on major ecological sites throughout the Tuledad Allotment in 1999, based the period of 1995 to 1998. The 1999 land health determination indicated that the fallback standards for soils, riparian/wetland, and biodiversity were being met, while the stream standard was not being met. Reasons for non-achievement of the standard were hot-season livestock use, yearlong wild horse use, and existing road placement.

The determination also noted that the predominant ecological sites on the allotment consist of claypan and loamy soils dominated by low sagebrush/Thurber's needlegrass/bluebunch wheatgrass and big sagebrush/Thurber's needlegrass vegetation types. The Buckhorn and Coppersmith HMAs contains several areas where upland vegetation has been impacted by past livestock grazing practices that have resulted in cheatgrass invasion. The salt desert shrub communities on the lower elevations of the allotment generally lack native bunchgrasses. Medusahead and cheatgrass have become established on clay pan soils on the south eastern side of the allotment as result of past disturbances. Many upper elevation vegetation communities are being impacted by western juniper encroachment.

In August 2012 the Rush Wildfire burned approximately 7,196 acres within the southern extent of the Buckhorn HMA. After fire operations are complete BLM Specialists will complete an aerial inventory of the HMA to determine how many horses are located in specific areas of the HMA, and to document the quantity of forage and water in these areas. A full analysis of vegetation conditions and restoration needs will be completed at this point to determine the course of action to be taken.

3.11 Wilderness Study Areas

Approximately 7,792 acres of the Buffalo Hills Wilderness Study Area (WSA) occurs within the south end of the Buckhorn HMA. There are no WSAs in the Coppersmith HMA. There are no designated Wilderness Areas in either HMA.

All BLM lands, including those in the project area, were inventoried for wilderness characteristics in 1979 as required under the Federal Land Policy and Management Act of 1976 (FLPMA). Under section 603 of FLPMA, lands found to have wilderness characteristics in the original 1979 inventory were designated as Wilderness Study Areas (WSAs). Under section 201 of FLPMA, the BLM is required to maintain current inventories of all public land resources, including wilderness characteristics. The wilderness characteristics inventory for lands within the project area was updated in 2009 as required under section 201 of FLPMA.

Wilderness characteristics are assessed using several screening criteria. Listed in order, they include; size, natural condition, outstanding opportunities for solitude or for primitive and unconfined recreation, and special or supplemental values (not required).

Size – To be sufficient size to have wilderness characteristics, an inventory unit is generally at least 5,000 contiguous roadless acres of public land where the imprint of human activity is substantially unnoticeable. In certain cases, a unit may be less than 5,000 contiguous acres.

Natural Conditions – The area within the unit boundary must appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable. Some imprints of human activity may exist in the area if they are substantially unnoticeable. More consideration is given to "apparent naturalness" rather than "natural integrity."

Outstanding Opportunities for Solitude – "Solitude" is defined as the state of being alone or remote from others; isolation; a lonely or secluded place. "Outstanding" is defined as standing out among others of its kind; conspicuous; prominent; superior to others of its kind; distinguished; excellent. This criteria considers an individual's opportunity to avoid sights, sounds, and evidence of other people in the unit.

Outstanding Opportunities for Primitive and Unconfined Recreation – Primitive and unconfined recreation includes activities that provide dispersed, undeveloped recreation which do not require facilities or motorized equipment.

Supplemental values are also considered in the wilderness inventory, however only if the other criteria have been met. Supplemental values are ecological, geological, or other features of scientific, educational, scenic, or historic value that may be present. If present, a description of these values is included in the inventory. The description should include a discussion of the relative quantity and quality of these values including anthropological, rare and endangered species, and heritage.

Buffalo Hills WSA

The Buffalo Hills WSA lies within Washoe County, NV (98%) and Lassen County, CA (2%) and contains 46,143 acres of BLM-administered land and 1,293 acres of private land. The Surprise Field Office manages 7,956 acres. The Buffalo Hills WSA was recommended by the BLM as non-suitable because its wilderness qualities, while present, do not distinguish the WSA from much of the surrounding area.

Naturalness: Much of the WSA is relatively flat, and contains shallow canyons bordered by rimrock. However, there are steep slopes and deep canyons in the southern and western portions. The area is dominated by shrubland vegetation (primarily sagebrush) with associated grasses. Interesting geological features include Hole-in the-Ground, a caldera-like feature that is 200 feet in depth, plus deep canyons eroded by the west, middle, and north forks of Buffalo Creek. The west and north fork canyons, in particular, are very impressive because of their steep-sided walls and dramatic scenery. The historic wagon road and military patrol route (used in the mid to late 1800s) between Fort Churchill (east of Carson City, NV) and Fort Bidwell (north of Cedarville, CA) followed the North Fork of Buffalo Creek.

The human imprint is primarily related to livestock grazing and includes nine miles of fence, ten stock ponds, five developed springs, and 26 miles of access ways. Nine miles of dead-end (cherry-stem) ways penetrate the WSA. Other than grazing permittees, use is primarily by hunters (primarily in fall).

Solitude: Throughout most of the year, human activities have little impact on solitude within the WSA. Livestock operators travel on existing roads and ways and occasional visits from hikers and horseback riders are seasonal and infrequent. During fall hunting season, mainly from mid-October through December, solitude is temporarily disturbed by hunter activity.

Primitive and Unconfined Recreation: Opportunities for primitive and unconfined types of recreation exist throughout the WSA; however, distinctive destination type features are lacking. Activities that occur with very low frequency are hiking, wildlife observation, wild horse observation, nature study, and geologic sightseeing.

Lands with Wilderness Characteristics

In 1979 lands throughout the Surprise Field Office were inventoried for wilderness characteristics. Eight wilderness inventory units are within or partly within the Buckhorn and Coppersmith HMAs. Six inventory units were found to not have wilderness characteristics (CA-020-602, CA-020-603, CA-020-703, CA-020-704, CA-020-705, CA-020-706), one inventory unit was found to meet the criteria for wilderness characteristics (CA-020-619), and the decision on one unit was deferred (CA-020-621).

3.12 Wildlife Habitat

Threatened and Endangered Species

There are no federally listed or proposed for listing wildlife species which are known to use the Buckhorn or Coppersmith HMAs, except for the greater sage-grouse. In March 2010, the USFWS announced its listing decision for the Greater sage-grouse (*Centrocercus urophasianus*) as "warranted but precluded". Candidate species designation means the USFWS has sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance is precluded by higher priority listing actions. At this time the species is officially considered a Candidate Species, but does not receive statutory protection under the Endangered Species Act (ESA). Individual states continue to be responsible for managing the birds. "Candidate species and their habitats are managed as Bureau sensitive species", (BLM Manual 6840, December 2008). See additional information under *Greater Sage-grouse* below.

Carson wandering skipper

Potential suitable habitat for the Carson wandering skipper (*Pseudocopaeodes eunus obscurus*), a federally endangered butterfly, has been identified within the Surprise Field Office boundary, however most lands within the Buckhorn and Coppersmith HMAs do not appear to be suitable for this species due to the lack of nectar sources. The designation of this habitat is based on vegetation and soil mapping units containing suitable vegetation/habitat requirements. Based on a GIS analysis of soils, only a small amount of potential habitat for Carson wandering skipper

(*Pseudocopaeodes eunus obscures*) could exist at the north edge of the Buckhorn HMA and south end of the Coppersmith HMA. These potential habitats are just below and just above (respectively) the known elevational limit for this species and approximately 50 miles from the closest known populations in Lassen County, California.

The USFWS provided discretionary conservation recommendations in the September 2007 Biological Opinion for the Proposed Resource Management Plan for the Surprise Field Office. The recommendation was to conduct surveys if potential habitat was located. Potential areas within the field office have been surveyed for saltgrass communities and Carson wandering skipper (CWS). While saltgrass has been found in some areas, many had few to no nectar sources. No CWS were found during surveys of the Field Office in 2008 and 2009. Potential habitat for CWS within the Coppersmith and Buckhorn HMAs was surveyed in July of 2009. No saltgrass was found in the Coppersmith HMA; some occurred in the Buckhorn HMA and no CWS were found. Current information indicates that Carson wandering skipper do not occur on the Surprise Field Office; therefore this species will not be discussed further.

California and BLM Sensitive Species

California bighorn sheep

No surveys have been conducted for bighorn sheep in the Buckhorn or Coppersmith HMAs, since this species is not found in these HMAs.

Pygmy rabbit

The 2006 Larrucea survey did not find any sign of pygmy rabbit (*Brachylagus idahoensis*) in the Buckhorn or Coppersmith HMAs (Larrucea, 2006). The spatial distribution of pygmy rabbits in the Surprise Field Office appears to end as the vegetation community changes from a mountain and basin big sagebrush community to a Wyoming sagebrush community (located near Surprise Valley). No pygmy rabbits or their sign or burrows have been documented on the California portion of lands managed by the SFO. Subsequent surveys in 2009 and 2010 did not detect pygmy rabbits in the Buckhorn or Coppersmith HMAs, although potential habitat exists in these areas. See Table 3.12.1 below for potential habitat based on soils and vegetation in each HMA.

Table 3.12.1 Potential Pygmy Rabbit Habitat within the Buckhorn and Coppersmith HMAs

HMA/Potential Pygmy Rabbit Habitat [1/]	Size (Acres)[2/]	Percent of HMA
Buckhorn	22,281	3%
Coppersmith	16,978	2.3%
Total of potential habitat in HMAs	39,259	5.3%

[1/] The designation of habitat types is based on soil mapping units containing suitable vegetation and habitat requirements.

[2/] Private lands are included in these acreages.

Pygmy rabbits are dependent on sagebrush, primarily big sagebrush (*Artemisia tridentata*) located in deeper soils. Soil types where burrows are found can be loamy to ashy and burrows are generally found greater than 72 cm (20 in) deep. In Oregon, overall shrub cover at pygmy rabbit sites averaged 28.8% and ranged from 21.0-36.2%. According to the species field report for the Ruby Pipeline, 60.0 percent of sites in Nevada exhibited 26–50 percent canopy cover. Larrucea and Brussard (2008) surveyed the historic range of pygmy rabbits in Nevada and California, and found a greater probability of occupancy by pygmy rabbits at sites with low (or no) understory. Pygmy rabbit burrows are almost always under big sagebrush and only rarely in the open.

Greater Sage-grouse

In 2011 the BLM initiated *RMP Amendments for Greater Sage-grouse* across the range of sage-grouse habitat managed by the BLM (western states) to ensure the long term conservation of the species and to avoid the need of listing the species under the Endangered Species Act of 1973. The completion date for the RMP Amendments is in 2015. This date corresponds to the USFWS timeline to evaluate the need for listing the species in light of the new conservation direction brought forth for greater sage-grouse under the BLM RMP Amendments. BLM policy and direction in the interim period are outlined in BLM Instruction Memorandum No. 2012-043.

In addition to this policy, the BLM released the *National Greater Sage-Grouse Conservation Measures/Planning Strategy Technical Team Report* released on December 21, 2011. This report describes recommended conservation measures for greater sage-grouse for each BLM land use or resource program area. The conservation measures relating to the Wild Horse and Burro Program are described on page 18. BLM IM 2012-043 requires the BLM to designate Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) boundaries. PPH comprises areas that have been identified as having the highest conservation value to maintaining sustainable greater sage-grouse populations. These areas would include breeding, late brood-rearing, and winter concentration areas. PGH comprises areas of occupied seasonal or year-round habitat outside of priority habitat. PPH and PGH boundaries within the Surprise Field office have been delineated by the BLM in coordination with respective state wildlife agencies (CDFG and NDOW). See Map 4.

On BLM lands of the Surprise Field Office, historic and active sage-grouse (*Centrocercus urophasianus*) strutting grounds known as "leks" are located primarily in open, low sagebrush habitats. Leks are areas where males display for breeding females. Early work estimated that most females nested within 2 miles of leks; however recent studies indicate that females may nest up to 4 miles away or further depending on surrounding habitat conditions (Knick and Connelly 2011). At least one radio collared female sage-grouse within the Surprise Field Office boundary successfully nested 9 miles from the lek she was captured on. Although many nests have been found in lower quality habitats (i.e. rabbitbrush dominated habitats or habitats with lack of perennial grasses and nesting cover) these are almost always unsuccessful due to nest abandonment and predation.

Sage-grouse nest on the ground, most often under taller sagebrush cover (15-38% shrub canopy; 36 -79 cm shrub height) such as the "big" sagebrush types and Wyoming sagebrush (Connelly,

2000). Successful nesting habitat generally contains taller grass cover in association with this sagebrush (Connelly, 2000) although there is some variability across the range of sage-grouse. Sage-grouse utilize sagebrush stands as both winter and nesting habitat. Sage-grouse feed on sagebrush buds and forbs throughout much of the year, especially early spring through fall. Peak egg-laying and incubation varies from late March through mid-June, with re-nesting stretching into early July. Brood-rearing habitats are wet meadow and riparian areas where the young can find abundant insects which are critical to their diets during the first few weeks of life. Estimated summer home range is 2.5 – 7 km^2 (618-1,730 ac) (Connelly, 2000). Forbs are important food sources for brood rearing and pre-nesting hens.

Sage-grouse within the Buckhorn and Coppersmith HMAs

During field visits within the HMAs, sage-grouse sign was found around near many riparian areas and on upland sites, indicating use of these areas by sage-grouse. Within the Buckhorn and Coppersmith HMAs there are six known active lek locations. Sage-grouse populations also exist within surrounding allotments. See Table 3.12.2 below for the number of leks by HMA and Table 3.12.3 for trends of lek complexes that lie within the Buckhorn and Coppersmith HMAs.

Table 3.12.2 Active Leks within the Buckhorn and Coppersmith HMAs

HMA Name	Active Leks within HMA (No.)
Buckhorn	1
Coppersmith	5
Total	6

The Buckhorn and Coppersmith HMAs are located entirely within the Buffalo-Skedaddle Population Management Unit (PMU). Greater sage-grouse use low sagebrush, riparian, and mountain big sagebrush communities year-round in these HMAs. According to NDOW data, up to 13 sage-grouse leks (strutting grounds) historically occurred in the Buckhorn HMA. Both aerial and ground surveys conducted by NDOW and this office over several years confirm that only one lek, the Garden Lake lek, is now active.

No exact cause is known as to why these leks disappeared; however changes in habitat from fire and possibly juniper encroachment appear to be some of the causal factors. Like other arid regions, riparian systems are particularly important to wildlife in this area. Most of the scarce riparian areas within this HMA are made up of ephemeral drainages and some perennial springs. Sage-grouse harvest data from the late 1950's and early 1960's showed that the Buckhorn HMA and in particular riparian areas were and still are important to sage-grouse during the fall.

Data from NDOW and the California Department of Fish and Game (CDFG), indicate that five historic active sage-grouse leks still occur in the Coppersmith HMA, although two leks have changed position about ½ mile. One lek, the Wire Lakes lek has very few birds in attendance and could become completely inactive in the near future. Ground observations indicate that scattered use occurs on the lek site with sage-grouse found on adjacent meadow systems in the

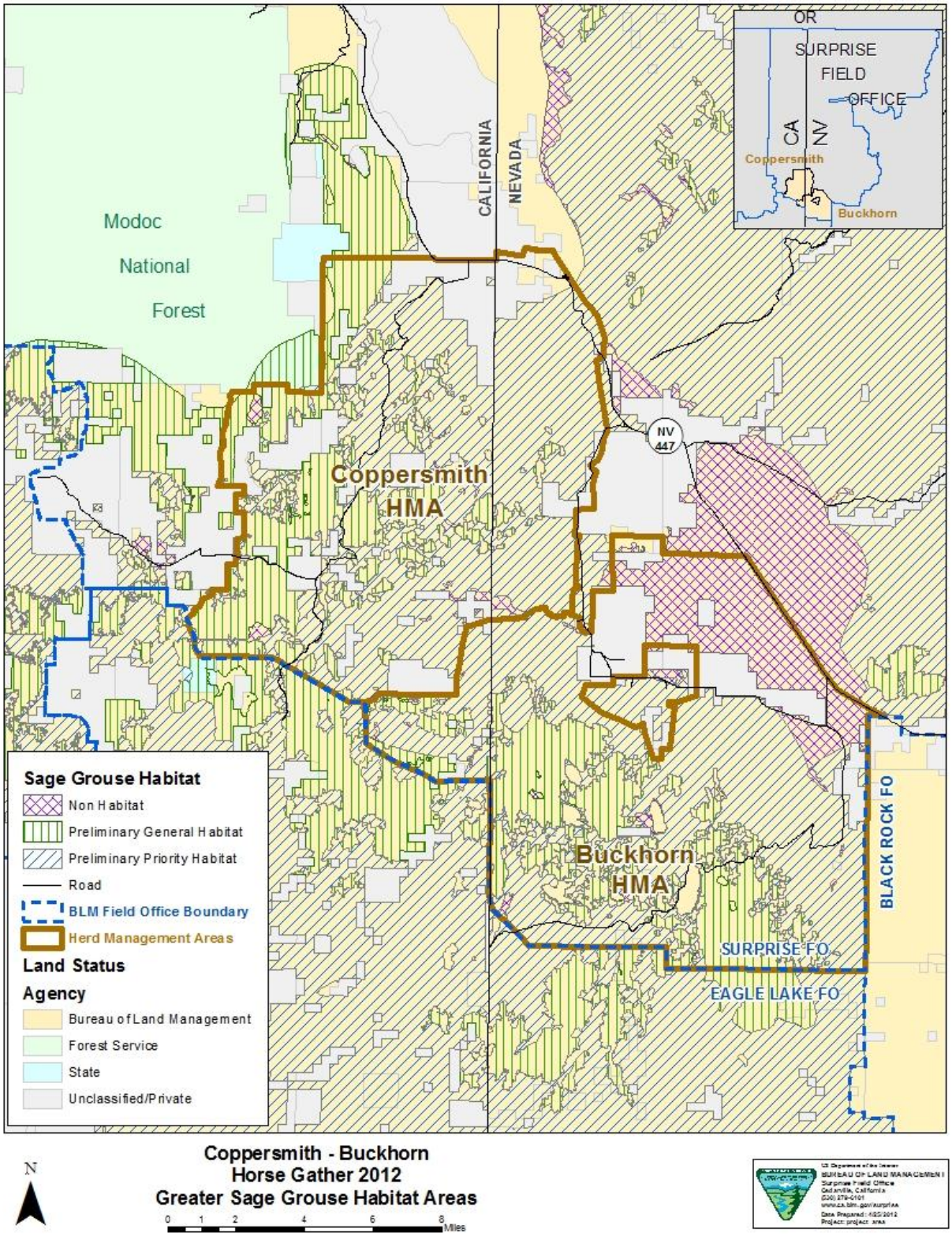
summer. It is believed that recent juniper encroachment may be one of the causal factors for the small numbers of birds on this lek. The following table shows the trends of lek complexes by attendance numbers within the Buckhorn and Coppersmith HMAs, between 2000 and 2009.

Table 3.12.3 Active Lek Attendance by HMA, 2002 – 2009

Active Lek Attendance within HMAs										
Lek Name/HMA	Sage-grouse Attendance at Lek Sites (No.) by Year									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Garden Lake/Buckhorn	0	NC	4	50	24	57	48	74	52	65
Wire Lake North/ Coppersmith	NC	NC	NC	0	0	0	2	0	NC	0
Tuledad Road North/ Coppersmith	NC	NC	NC	0	0	0	0	0	3	6
Tuledad Valley Rim/ Coppersmith	0	NC	NC	0	0	2	0	0	0	1
Tuledad Valley/Coppersmith	NC	NC	NC	NC	6	0	1	NC	0	NC
Tuledad Road/Coppersmith	NC	NC	0	NC	22	26	4	NC	10	6
Complex Total	**0**	**NC**	**4**	**52**	**85**	**55**	**74**	**65**	**78**	**52**

NC= No count for that year.

Map 4. Greater Sage-grouse Habitat in the Buckhorn and Coppersmith HMAs



Golden eagle and other raptors

The golden eagle, a BLM sensitive species, is found within the Buckhorn and Coppersmith HMAs and other raptors are commonly observed throughout these areas. The canyons within the HMAs support several species of raptors, as well as chukar and quail. Various raptors include red-tailed hawks, golden eagles and prairie falcons, which regularly hunt within these HMAs, and there is one recorded golden eagle nest site within the Coppersmith HMA.

Table 3.12.4 Raptor Nest Sites Located by HMA

Herd Management Area	Species at Nest Site	Number of Known Nest Sites
Buckhorn	None	0
Coppersmith	Golden Eagle	1
Total		1

Ungulates

Pronghorn antelope

Pronghorn antelope (*Antilocapra americana*), or pronghorn, can be found throughout the Buckhorn and Coppersmith HMAs. Low sagebrush habitats are the most frequented habitats throughout the year by pronghorn antelope. Pronghorn prefer open rangelands that support a variety of vegetative types. Areas with low shrubs typify summer habitat with a diversity of native grasses and forbs (Gregg *et. al.* 2001). Vegetative heights where pronghorn are found can vary; however 10-18 inches has been reported for pronghorn in grassland and shrub steppe communities (Yoakum 2004). Pronghorn do not appear to be dependent on open water if there is sufficient moisture in the vegetation (Reynolds 1984, O'Gara 1978). Although forbs are an important component of pronghorn diet, browse is the dominant food ingested (Pyshora 1977). As for all big game species, forbs are preferred forage and contribute a high amount of protein and minerals to the diet of pronghorn antelope.

The wide range of elevation and habitat types in the Buckhorn and Coppersmith HMAs results in a wide variety of wildlife habitat types. The mosaics of low sagebrush and big sagebrush communities provide spring, summer, and fall habitat for pronghorn antelope. Many pronghorn antelope move to the lower portions of the HMA during the winter and during more severe winters will leave the HMA in search of lower elevation habitats with lesser amounts of snow cover. The Nevada Department of Wildlife's (NDOW) population estimate in 2007 was 4,000 pronghorn between Units 011-015. NDOW's 2007 wildlife report shows fluctuations for these populations over the last 31 years. In 2007, estimated populations throughout Nevada were above average for pronghorn antelope.

Within the Buckhorn and Coppersmith HMAs meadows are especially important summer habitats for pronghorn populations. Meadows provide succulent, high quality forage and water during the hot summer months.

Mule deer

Mule deer (*Odocoileus hemionus*) use occurs throughout the year in the Buckhorn and Coppersmith HMAs. The Nevada Department of Wildlife's (NDOW) population estimate in 2007 was 500 mule deer in Unit 015, which includes the Coppersmith and Buckhorn HMAs. According to NDOW, big game animals are experiencing declines due to drought condition (7 of the last 10 years) effects on vegetation and competition with wild horses for limited forage and water resources.

Areas where the vegetation consists primarily of low sagebrush and associated grasses and forbs are often avoided because of the lack of hiding cover (e.g. big sagebrush spp.) and thermal cover. Within the HMAs there are interconnected expanses of heavier shrub cover and tree cover that are seasonally used by mule deer. Areas where a mixture of Wyoming, mountain, and big sagebrush exist are typically the areas where mule deer use is concentrated (although mule deer are observed in all sagebrush habitats), with most mule deer seeking higher elevation areas in the summer months. To aid in thermoregulation, deer utilize various topographic aspects, south in the winter and north in the summer. Heavy shrub and tree cover also aids in thermoregulation.

Deer are generally classified as browsers, with shrubs and forbs making up the bulk of their annual diet. Grasses are generally only consumed early in the spring when they are still green and higher in total digestible nutrients. The diet of mule deer is quite varied and the importance of various classes of forage plants varies by season; however sagebrush and bitterbrush are important components throughout the year.

Other Native Wildlife Species

Other species known to occupy within the Buckhorn and Coppersmith HMAs include black-tailed jackrabbit, ground squirrel, badger, lizards, coyote, mountain lion, raven, northern harrier and various songbirds. Data points from survey blocks conducted by the Great Basin Bird Observatory indicate that several sage-steppe obligate birds besides Greater sage-grouse are likely to be found within these areas. These include Brewer's sparrow, sage thrasher, and sage sparrow. These birds require a mix of open, patchy sagebrush, tall sagebrush, and grass cover for nesting and foraging. Active rodent burrows and ant hills were found during field tours, indicating a diversity of non-game species.

Sage sparrows (*Amphispiza belli*) are often associated with big sagebrush, but other shrublands are also regularly used with bare ground preferred over grass cover between shrubs. Their nest is a cup of dry twigs and herbaceous stems located on the ground beneath a shrub; or in a shrub usually 0.15 to 0.45 m (6-18 in) above ground, but up to 1 m (39 in). Their known breeding in Nevada is from early April to early August, with a few remaining to winter in the Great Basin each year. Sage sparrows tend to abandon sites that lose sagebrush cover or sites with a substantial cheatgrass component. This species feeds mostly on insects, spiders, and seeds while

breeding, and mostly on seeds in winter; they also consume green foliage. Although sage sparrows drink regularly, a portion of their water needs are supplied by consumption of invertebrates. Sage thrashers occupy similar habitats as the sage sparrow and avoid cheatgrass infested areas. Sage thrashers often are found along riparian drainages and corridors after the breeding season. Sage sparrows prefer sage-steppe habitats that have a large grass component and are often found at higher elevation sagebrush sites, although they can occur throughout sage-steppe habitats. The range for many non-game wildlife and bird species overlap due to the heterogeneity of habitats that are found within the HMAs.

Fish

Several creeks occur in the Coppersmith HMA, including Bare Creek, Silver Creek, and North Creek. The 2003 stream survey of these creeks identified brown and red-band trout and speckled dace in Bare Creek; red-band and brown trout in Silver Creek; and red-band only in North Creek. North and Silver creeks feed into Bare Creek. The perennial water in Newland Reservoir and Boot Lake provide significant waterfowl habitat along with other ephemeral water sources like Pilgrim Reservoir. In addition, several of the perennial to intermittent streams, including Tuledad Creek, Express Canyon, Post Canyon, and Worland Canyon, support populations of warm-water fish (dace).

Migratory Birds

Migratory birds are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*) and Executive Order 13186. Under the MBTA nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Executive Order 13186 directs federal agencies to promote the conservation of migratory bird populations.

Most of the vegetation communities on the Buckhorn and Coppersmith HMAs are characterized by sagebrush species, primarily Wyoming sagebrush, mountain big sagebrush, basin big sagebrush, and low sagebrush, although other sagebrush species exist within the HMAs. Migratory birds associated with these vegetative communities may include:

- black-throated sparrow (*Amphispiza bilineata*),
- Brewer's blackbird (*Euphagus cyanocephalus*),
- Brewer's sparrow (*Spizella breweri*),
- Canyon wren (*Catherpes mexicanus*),
- gray flycatcher (*Empidonax wrightii*),
- green-tailed towhee (*Pipilo chlorurus*),
- loggerhead shrike (*Lanius ludovicianus*),
- rock wren (*Salpinctes obsoletus*),
- sage sparrow (*Amphispiza belli*),

- sage thrasher (*Oreoscoptes montanus*),
- western meadowlark (*Sturnella neglecta*), and
- vesper sparrow (*Pooecetes gramineus*).

Most of these species require a diversity of plant structure and herbaceous understory. High levels of plant species diversity provides habitat for nesting, foraging and cover for a variety of species. Woodland species such as juniper offer nesting and foraging opportunities for many of these species. Riparian areas with a woody riparian plant species component are important habitats for some migratory bird species as they provide important foraging and nesting habitats. Riparian areas also serve as important transition habitats for a variety of species between seasons and are often heavily used during summer months. Habitat components for many of these species are available in small habitat patches throughout the HMAs.

Migratory birds often use pit reservoirs within the HMAs. Species that are often observed include:

- Canada geese (*Branta canadensis*),
- mallard (*Anas platyrhynchos*),
- gadwall (*Anas strepera*),
- American widgeon (*Anas americana*),
- common goldeneye (*Bucephala clangula*),
- Killdeer (*Charadrius vociferus*),
- Snipe (*Gallinago gallinago)* and
- Other migratory birds commonly seen in wetland-marsh environments.

3.13 Public Health and Safety

In recent gathers, members of the public have increasingly traveled to the public lands to observe BLM's gather operations. Members of the public can inadvertently wander into areas that put them in the path of wild horses that are being herded or handled during the gather operations, creating the potential for injury to the wild horses or burros and to the BLM employees and contractors conducting the gather and/or handling the horses as well as to the public themselves. Because these horses are wild animals, there is always the potential for injury when individuals get too close or inadvertently get in the way of gather activities. The helicopter work is done at various heights above the ground, from as little as 10-15 feet (when herding the animals the last short distance to the gather corral) to several hundred feet (when doing a recon of the area).

While helicopters are highly maneuverable and the pilots are very skilled in their operation, unknown and unexpected obstacles in their path can impact their ability to react in time to avoid members of the public in their path. When the helicopter is working close to the ground, the rotor wash of the helicopter is a safety concern for members of the public by potentially causing loose vegetation, dirt, and other objects to fly through the air which can strike or land on anyone

in close proximity as well as cause decreased vision.

During the herding process, wild horses or burros will try to flee if they perceive that something or someone suddenly blocks or crosses their path. Fleeing horses can go through wire fences, traverse unstable terrain, and go through areas that they normally don't travel in order to get away, all of which can lead them to injure people by striking or trampling them if they are in the animal's path.

Disturbances in and around the gather and holding corral have the potential to injure the government and contractor staff who are trying to sort, move and care for the horses and burros by causing them to be kicked, struck, and possibly trampled by the animals trying to flee such disturbance. Such disturbances also have the potential for similar harm to the members of the public.

Public observation would be allowed on all days that gather activities occur on public lands. The BLM would designate and flag public observation areas that minimize the potential for injury to members of the public, BLM staff, gather contractors and the wild horses begin gathered, and disruption of gather operations. Working with the gather contractor, the BLM would attempt to find locations at each public land trap site where credentialed members of the news media would have limited opportunities for a closer view.

This observation protocol would be consistent with BLM IM No. 2010-164 and in compliance with Observation Day Protocol and Ground Rules for scheduled and nonscheduled visitation.

4.0 ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences of implementing Alternatives A, B, C and D listed in Section 2.0 on resources within the Buckhorn and Coppersmith HMAs. This section describes the Direct and Indirect Effects, and Cumulative Effects for all resources that may be impacted from the alternatives.

This analysis of effects is based on the premise that all standard operating procedures found in Appendix A and B, and other BLM requirements will be followed during the implementation of the Proposed Action and other alternatives. Design features or management practices which are intended to avoid or minimize environmental harm and which have been incorporated into the alternatives are treated as an inherent part of the action. The assessment of environmental consequences is tiered to the Surprise RMP/EIS, 2008. The analysis is based on the best available information.

4.1 Cumulative Impacts

The NEPA regulations define cumulative impacts as impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

For the purposes of analyzing cumulative impacts on all affected resources within the assessment area, the following list describes the past, present, and reasonably foreseeable relevant actions within the Buckhorn and Coppersmith HMAs. The Cumulative Assessment Area (CAA) for the purpose of evaluating the combined cumulative impacts is the Buckhorn and Coppersmith HMAs boundary for all resources, except for cultural resources, which is the Tuledad/Duck Flat Cultural Resource Management Area boundary, as shown on Map 3.

4.1.1 Past and Present Actions

1. In August 2012 the Rush Wildfire burned approximately 7,196 acres within the southern extent of the Buckhorn HMA. After fire operations are complete BLM Specialists will complete an aerial inventory of the HMA to determine how many horses are located in specific areas of the HMA, and to document the quantity of forage and water in these areas. A full analysis of vegetation conditions and restoration needs will be completed at this point to determine the course of action to be taken.

2. Domestic cattle, sheep, and horse grazing have occurred within the Buckhorn and Coppersmith HMAs for at least 150 years. Initially cattle were turned out in the area to take advantage of vast stands of native bunchgrasses. Cattle grazing had a profound impact on native vegetation in areas within a few miles of existing water sources, primarily springs. Starting in the early 1900's sheep grazing, primarily by itinerant herders, took place in addition to the ongoing cattle grazing. Tuledad Canyon was a major trailing corridor between the shipping locations in CA and NV. Sheep were herded to

areas outside the areas heavily grazed by cattle, primarily during the spring months. At times dozens of sheep bands covered the landscape. Sheep grazing began to decrease during the droughts associated with the Dust Bowl Era and the advent of the Taylor Grazing Act, which favored cattle users with established ranches over sheep herders without ranch property.

Since the advent of the Taylor Grazing Act (TGA) in the mid-1930s, levels of livestock grazing in these HMAs have decreased dramatically. Prior to the Act, livestock grazing was uncontrolled so exact levels of grazing are unknown. The limited existing records, along with the condition of vegetation and other resources during the 1930s and 1940s provide historic accounts that point to grazing levels many times greater than what are currently harvested by livestock and wild horses combined. During World War II ranchers were encourage to produce as much meat and hide as possible from public land in support of the war effort.

Livestock grazing continues to be authorized under the provisions of the TGA in the Tuledad Allotment. Seasons of use are generally 5-6 months long, and livestock turnout areas and multiple pastures are used to manage the frequency, duration and intensity of grazing on native bunchgrasses. Section 3.5 above provides additional information.

3. Domestic horses also used the public lands for grazing to supply local, regional and national demand for working animals. Demand for horses decreased during the period prior to World War II as motor vehicles replaced horses for both civilian and military uses. The present horse populations are largely the remnants of these historic horse operations. After World War II, horses were periodically gathered by local landowners and ranchers and sold for horse meat, when commodity prices were high enough for this to be profitable, up until 1971 when the WFRHBA was enacted.

4. Wild horse use has continued in the two HMAs since 1971. In years that the populations of wild horses have exceeded the established AML range, disturbance to uplands and riparian/wetland sites has occurred in some areas. Between 1983 and 2009 the BLM completed fifteen wild horse gather operations (primarily using a helicopter) within the two HMAs in order to remove excess animals to manage the population size within the established AML ranges. Approximately 1,565 excess animals have been removed from the HMAs and transported to short-term corral facilities, where they were prepared for adoption, sale (with limitations), long-term pasture, or other statutorily authorized disposition.

5. Several important vegetation communities, riparian/wetland areas, or cultural resource sites have been fenced or partially fenced from livestock grazing and from wild horse use within the Buckhorn and Coppersmith HMAs. These include Bud Brown (506 acres), Lower Ant Spring (14 acres), and Nova Spring (8 acres).

6. Prior to the TGA, livestock grazing practices significantly impacted soil resources. The soil erosion tolerance was exceeded and the soil medium for plant growth was not maintained. As a result, livestock grazing activities in the past had major impacts to the

vegetation resources within the impact assessment area by eliminating or greatly reducing the amount of primary understory plants. Cheatgrass, an invasive annual grass, was introduced into the area in the early 1900s.

7. Prior to the TGA, livestock grazing practices also greatly impacted wetland and riparian sites. Wetland and riparian sites declined in size and number, riparian vegetation became insufficient to dissipate energy or to filter sediments, and increased erosion and sediment lead to the destabilization and degradation of stream banks and meadows. Destabilization of streams and meadows led to the development of incised channels and gullies, which resulted in a lowered water table. In order to prevent adverse impacts to rangeland and riparian health a variety of range improvement projects have been implemented by the BLM and private landowners to increase livestock distribution and allow for enhanced management of livestock grazing through grazing systems and rotations that will achieve rangeland health standards.

8. The BLM has conducted Integrated Weed Management for the past 20 years to monitor and treat infestations of noxious weeds and invasive species.

9. In the absence of wildfire western juniper has increased greatly within the big sagebrush and mountain sagebrush communities. This is especially true in the Coppersmith HMA.

10. Recreation use has occurred mainly in the form of wilderness recreation, hiking, camping, and hunting. Activities that have occurred with very low frequency are wildlife observation, nature study, and archaeological sightseeing.

11. Some areas of the HMAs have been impacted by off-highway vehicle use that has occurred off of established roads and trails. The Surprise RMP, 2008 limited all off-highway vehicle use to designated trails.

12. Portions of the Buckhorn HMA were designated as a Wilderness Study Area by Congress in 2000. This area is being managed for its wilderness values, including natural landscapes, vegetation and wildlife communities.

4.1.2 Reasonably Foreseeable Future Actions

1. Cattle and sheep grazing are expected to continue on the Tuledad Allotment within the HMAs, at roughly the same stocking levels and seasons of use as currently permitted, unless recent wildfire activity has reduced forage capacity. Periodic assessments of livestock grazing in relation to Land Health Standards are likely to result in minor changes in livestock management practices or the installation of protective fencing.

2. The BLM will conduct emergency stabilization and rehabilitation measures within the recently burned areas affected by the Rush Wildfire to reduce erosion, restore native plant communities, and maintain or improve wildlife habitat.

3. Wild horses will continue to be found and thrive within the two HMAs. Gathers and

removals will be expected to occur on a 3-5 year schedule in order to manage the populations within or near the designated AMLs for each HMA. Less frequently, resource monitoring information will be used to assess the AML, and potentially adjust AMLs, within each HMA. The direction or magnitude of any AML adjustment is impossible to predict.

4. Inventory efforts to identify new infestations of noxious weeds will continue, and the BLM will provide treatment of identified infestations.

5. Recreation use will continue at approximately the same levels as presently occur. Recreational uses will be associated with hunting and general sightseeing.

6. Sage-grouse lek (breeding ground) counts will continue within the HMAs, to collect population data, and to monitor habitat conditions.

7. Fencing of riparian/wetland areas will be considered to protect vegetation and cultural resources from grazing and trampling damage by livestock and wild horses.

8. In the absence of a major wildfire western juniper will continue to expand into sagebrush steppe communities, which will reduce the amount of grass, forb, and native shrub production.

4.2 Effects on Wild Horses and their Habitat

4.2.1 Population Modeling

Wild horse population dynamics for the Buckhorn and Coppersmith HMAs were predicted using the WinEquus program, Version 1.40, created April 2, 2002. This program was designed to assist Wild Horse Specialists in modeling various management options, and to project possible outcomes for the management of wild horses. The model was run for a ten year period to determine what the potential effects would be on wild horse population size and growth rates for all Alternatives (A, B, C, and D). These modeling prediction numbers are not used for making specific management decisions such as gather and removal numbers. Instead the model is used to make relative comparisons of the different alternatives and of the potential outcomes under different management options. One objective of the modeling is to project if the Proposed Action or other alternatives would "crash" the population or cause extremely low population numbers or growth rates. The population modeling criteria that were used for all of the Alternatives (as applicable) are:

- Starting Year: 2012
- Sex ratio at birth: 50% male, 50% female
- Foals are included in the AML
- Simulations were run for ten years with 100 trials each
- Initial gather year: 2012
- Gather interval: minimum interval of three years

- For Alternatives A and B the gathers to be triggered by the population reaching maximum AML (85 horses for the Buckhorn HMA, and 75 horses for the Coppersmith HMA).
- Percent of the population that can be gathered: 95%
- For Alternatives A and C, fertility control effectiveness for treated mares is assumed to be 80% the first year, 65% the second year, and 50% the third year after treatment.
- For Alternative A, the HMAs would not be gathered for fertility control regardless of population size, but only when the population exceeds the high end of the AML. Ongoing gathers would continue after population goals are met to secure additional mares for fertility treatment.
- For Alternative C, the HMA would be gathered for fertility control regardless of population size.

The WinEquus population modeling data for population size and growth rates for the Buckhorn and Coppersmith HMAs are displayed in Tables 4.1 and 4.2 below.

Table 4.1 Predicted Population Size in 10 Years – Buckhorn and Coppersmith HMAs

HMA	Alternative A. Proposed Action			Alternative B. Removal			Alternative C. Fertility Control			Alternative D. No Action		
	Median Population Size (No.) 1/											
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Buckhorn	61	89	188	64	99	188	187	356	554	189	467	844
Coppersmith	52	68	88	52	73	104	81	158	235	80	201	358
Total	113	157	276	116	172	292	268	514	789	269	668	1202

1/ These numbers are derived from the median values listed for each HMA in Table 5 and Table 10 of *Appendix C. Summary of Population Modeling of Wild Horses in the Buckhorn and Coppersmith HMAs.*

Table 4.2 Predicted Average Growth Rate in 10 Years – Buckhorn and Coppersmith HMAs

HMA	Alternative A. Proposed Action	Alternative B. Removal Only	Alternative C. Fertility Control Only	Alternative D. No Action
	Median Growth Rate (%)1/			
Buckhorn	9.7	16.9	11.2	16.2
Coppersmith	10.4	15.0	11.1	15.8
Range	9.7 – 10.4	15.0 – 16.9	11.1 – 11.2	15.8 – 16.2
Average	**10.0**	**15.9**	**11.2**	**16.0**

1/ These numbers are derived from the median values listed for each HMA in Table 6 and Table 11 of *Appendix C. Summary of Population Modeling of Wild Horses in the Buckhorn and Coppersmith HMAs.*

Table 4.3 shows the number of wild horses impacted from gather operations within the two HMAs over the next ten years.

Table 4.3 Horses Gathered (G), Removed (R), and Treated (T) in 10 years – Buckhorn and Coppersmith HMAs

HMA	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	Median Number of Horses [1/]											
	G	R	T	G	R	T	G	R	T	G	R	T
Buckhorn	234	107	14	196	149	0	791	0	170	0	0	0
Coppersmith	196	65	21	102	88	0	348	0	72	0	0	0
Total	430	172	35	298	237	0	1139	0	242	**0**	**0**	**0**

[1/] These numbers are derived from the median values listed for each HMA in Table 8 and Table 13 of *Appendix C. Summary of Population Modeling of Wild Horses in the Buckhorn and Coppersmith HMAs.*

4.2.2 Effects Common to Alternative A (Proposed Action), Alternative B and Alternative C

Impacts to wild horses under Alternatives A, B, and C would be both direct and indirect, occurring to both individuals and the populations as a whole. The BLM has been actively conducting wild horse gathers since 1983 within the Surprise Field Office. Over this period, gather methods and procedures have been identified and refined throughout the western Unites States, in order to minimize stress and impacts to wild horses during implementation of gather operations. The BLM and Contractor would implement the standard operating procedures (SOPs) that have been developed to ensure that a safe and humane gather occurs, and to minimize potential stress and injury to wild horses. The SOPs are outlined in Appendix A and Appendix B.

Since 2004, the BLM has gathered over 26,000 excess animals in California and Nevada. Of these, mortality has averaged 0.5% to 1.0% which is very low when handling wild animals. Another 0.6% of the animals captured were humanely euthanized due to pre-existing conditions and in accordance with BLM policy. This data affirms that the use of helicopters and motorized vehicles has proven to be a safe, humane, effective and practical means for the gather and removal of excess wild horses from the public lands. The BLM also avoids gathering wild horses prior to or during the peak of foaling and therefore does not conduct helicopter removals of wild horses during March 1 through June 30.

Over the past 40 years, various impacts to wild horses from wild horse gather operations have been observed. Individual, direct impacts include handling stress associated with the gather, capture, sorting, animal handling, and transportation of the animals. The intensity of these impacts varies by individual animal, and is indicated by behaviors ranging from nervous agitation to physical distress. Observations made through completion of gathers shows that captured wild horses acclimate quickly to the holding corral situation, becoming accustomed to water tanks and hay, as well as human presence. Wild horses are very adaptable animals, and will typically assimilate into the new environment with other animals quite easily (Heleski, *et al.* 2010).

Injuries sustained by wild horses during gathers include nicks and scrapes to the legs, face, or

body from brush or tree limbs while being herded at a measured pace by the helicopter. Rarely, animals will encounter barbed wire fences and will receive wire cuts. These injuries are not fatal and may be treated with medical spray at the holding corrals until a veterinarian can examine the animal. Most injuries are sustained once the animal has been captured, and is either within the trap corrals or holding corrals, or during transport between the facilities, or during sorting. These injuries result from kicks and bites, and from animals making contact with corral panels or gates.

Transport and sorting of gathered horses is completed as quickly and safely as possible to reduce the occurrence of fighting, and to move the animals into large holding pens so they can settle in with hay and water as soon as possible. Injuries received during transport and sorting consist of superficial wounds of the rump, face, or legs. Despite precautions, occasionally a wild horse will rear up and strike overhead braces in alleyways or working chutes, or make contact with corral panels hard enough to sustain a fatal injury, though such incidents are rare. There is no way to reasonably predict any of these types of injuries. On many gathers, no animals are injured or die. On some gathers, due to the temperament of the animals, they are not as calm, and injuries are more frequent. Overall, however, injuries and death are not frequent and usually average less than 0.5% to 1.0% of the total animals captured.

During the actual herding of wild horses with a helicopter, injuries are rare, and consist of scrapes and scratches from brush, or occasionally broken legs from animals stepping into a rodent hole. Serious injuries requiring euthanasia could occur in 1-2 animals per every 1,000 captured based on prior gather statistics. Though some members of the public have expressed the view that helicopter gathers are not humane, most documented injuries have occurred once the animals are captured, not during the helicopter gather operations. Similar injuries would also be sustained if the horses were captured through bait and/or water trapping, as the animals would still need to be sorted, aged, transported and otherwise handled.

Indirect individual impacts are those impacts which occur to individual horses after the initial stress event, and may include spontaneous abortions in mares, and increased social displacement and conflict in stallions. These impacts, like direct individual impacts, are known to occur intermittently during gather operations. An example of an indirect individual impact would be the brief skirmish which occurs with older studs following sorting and release into the stud pen which lasts less than two minutes, and ends when one stud retreats. Traumatic injuries usually do not result from these conflicts. These injuries typically involve a bite and/or kicking with bruises, which do not break the skin. Like direct individual impacts, the frequency of occurrence of these impacts among a population varies with the individual. Spontaneous abortion events among mares following capture is relatively rare, especially during late summer or early fall gathers.

A few foals may be orphaned during gathers. This may occur due to:

- The mare rejects the foal. This occurs most often with young mothers or very young foals;
- The foal and mother become separated during sorting, and cannot be matched;

- The mare dies or must be humanely euthanized during the gather;
- The foal is ill, weak, or needs immediate special care that requires removal from the mother; or
- The mother does not produce enough milk to support the foal.

Rarely, foals are gathered that were already orphans on the range (prior to the gather) because the mother rejected it or died. These foals are usually in poor, unthrifty condition. Orphans encountered during gathers are cared for promptly and rarely die or have to be euthanized.

The foals that would be gathered in the Buckhorn and Coppersmith HMAs during fall or summer of 2012 to 2015 would be between four and seven months of age and would be ready for weaning from their mothers. In private industry, domestic horses are normally weaned between four and six months of age. Adherence to standard operating procedures, as well as the techniques utilized by the gather contractor, would be implemented to minimize heat stress. Electrolytes are routinely administered to the drinking water during gathers that involve animals in weakened conditions or during summer gathers. Additionally, BLM staff maintains supplies of electrolyte paste to directly administer to an affected animal. Heat stress does not occur often, but if it does, death can result. Gathering during the fall and winter months decreases the likelihood of heat related problems due to cooler ambient temperatures.

Through the capture and sorting process, wild horses are examined for health, injury and other defects. Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy. BLM Euthanasia Policy IM-2009-041 is used as a guide to determine if animals meet the criteria and should be euthanized (refer to SOPs Appendix A). Animals that are euthanized for non-gather related reasons include those with old injuries (broken hip, leg) that have caused them to suffer from pain, or prevent them from being able to travel or maintain body condition. The old animals that have lived a successful life on the range, but now have few teeth remaining, are in poor body condition, or are weak from old age; and animals that have congenital, genetic, or serious physical defects such as club foot, ruptures, or sway back, and would not be successfully adopted, or should not be returned to the range.

The wild horses that are not captured may be temporarily disturbed and move into other areas during the gather operations. With the exception of changes to herd demographics, direct population-wide impacts seem to be temporary in nature, with most if not all impacts disappearing within hours to several days of release. No observable effects associated with these impacts would be expected within one month of release, except for a heightened awareness of human presence (Heleski, *et al.* 2010).

4.2.3 Effects Common to Alternative A (Proposed Action) and Alternative B

Alternatives A and B include the gather and removal of wild horses in the Buckhorn and Coppersmith HMAs in order to reduce the populations to the low end of their respective appropriate management levels. The results of the WinEquus population modeling predict

that the resulting median number of horses over a 10 year time period for Alternative A would be 89 in Buckhorn, and 68 in Coppersmith for a total of 157. For Alternative B the resulting median number of horses over a 10 year time period for Alternative A would be 99 in Buckhorn and 73 in Coppersmith for a total of 172. Alternative A would result in horse numbers slightly below the established high AML range of 160 horses (98% of AML). Alternative B would result in horse numbers slightly above the established high AML range of 160 horses (110% of AML). These are predicted values for wild horse population and are close enough to each other (within 10%) that the impacts resulting from both alternatives are predicted to be similar, and will be analyzed together in this document. Neither the Proposed Action nor Alternative B would result in a crash to the population according to the Population Modeling Results in Appendix C.

Implementation of Alternative A or B would result in a lower density of wild horses across the two HMAs, which would reduce competition for resources, thus allowing wild horses to utilize preferred, quality habitat. This would also reduce emigration rates to areas outside the HMAs. Confrontations between stallions and fighting amongst horse bands at water sources may also become less frequent.

The primary effects to the populations that would be directly related to this proposed gather would be to herd population dynamics, age structure, and subsequently to the growth rates and population size over time. It is not expected that genetic health would be adversely impacted by Alternatives A or B. Maintaining animals within the established combined AML range of 109-160 wild horses, in addition to movements within and outside of the HMAs, will provide the best opportunity for genetic health. Following analysis of horse hair samples collected in 2012, the BLM will work with Dr. Gus Cothran to develop future plans and actions to better maintain and further improve genetic health of the wild horses.

The primary benefit of achieving and maintaining the established AML within the HMAs would be to the health and sustainability of habitat attributes. Forage and water resources would be allowed to improve in quality and quantity. Improved rangeland and riparian/ wetland conditions and increased forage availability would promote healthy viable, self-sustaining populations of wild horses. A thriving ecological balance between wild horses and other resource uses would be met throughout the HMAs, and future deterioration of the resources from an overpopulation of wild horses would be avoided. Managing wild horse populations in balance with their habitat and with other multiple uses would ensure that the populations are less affected by drought or other climate fluctuations, and that emergency gathers are either avoided or minimized. This would result in reduced stress to the animals, and increasing the long-term success of these herds.

Impacts to Wild Horses Removed from the HMAs

Transport, Short Term Holding, and Adoption Preparation

Wild horses removed from the HMAs would be transported to the receiving short-term holding facility in a goose-neck stock trailer or straight-deck semi-tractor trailers. Trucks and trailers used to haul the wild horses will be inspected prior to use to ensure wild horses can be

safely transported. The animals would be segregated by age and sex when possible, and loaded into separate compartments. Mares and their un-weaned foals may be shipped together.

Transportation of recently captured wild horses is limited to a maximum of 8 hours. During transport, potential impacts to individual wild horses can include stress, as well as slipping, falling, kicking, biting, or being stepped on by another animal. Unless the animals are in extremely poor condition, it is rare for an animal to die during transport.

Upon arrival, recently captured wild horses are off-loaded by compartment and placed in holding pens where they are fed good quality hay and water. Most wild horses begin to eat and drink immediately and adjust rapidly to their new situation. At the short-term holding facility, a veterinarian provides recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club foot, and other severe congenital abnormalities) would be humanely euthanized using methods acceptable to the American Veterinary Medical Association (AVMA). Wild horses in very thin condition or animals with injuries are sorted and placed in hospital pens, fed separately and/or treated for their injuries. Recently captured wild horses, generally mares, in very thin condition may have difficulty transitioning to feed. A small percentage of animals can die during this transition, however some of these animals are in such poor condition that it is unlikely they would have survived if left on the range (Heleski, *et al.* 2010).

After recently captured wild horses have transitioned to their new environment, they are prepared for adoption or sale. The preparation involves freeze-marking the animals with a unique identification number, vaccination against common diseases, castration, and de-worming. During the preparation process, potential impacts to wild horses are similar to those that can occur during transport. Injury or mortality during the preparation process is rare, but can occur.

At short-term corral facilities, a minimum of 700 square feet is provided per animal. Mortality at short-term holding facilities averages approximately 5% (GAO-09-77, Page 51), and includes animals euthanized due to a pre-existing condition, animals in extremely poor condition, animals that are injured and would not recover, animals which are unable to transition to feed; and animals which die accidentally during sorting, handling, or preparation.

Adoption

Adoption applicants are required to have at least a 400 square foot corral with panels that are at least six feet tall. Applicants are required to provide adequate shelter, feed, and water. The BLM retains title to the horse for one year and the horse and facilities are inspected. After one year, the applicant may take title to the horse, at which point the animal becomes the property of the applicant. Adoptions are conducted in accordance with 43 CFR Subpart 4750.

Sale with Limitation

Buyers must fill out an application and be pre-approved before they can buy a wild horse. A sale-eligible wild horse is any animal that is more than 10 years old; or has been offered unsuccessfully for adoption at least 3 times. The application also specifies that all buyers are not to sell to slaughter buyers, or to anyone who would sell the animals to a commercial processing plant. Sale of wild horses is conducted in accordance with the 1971 WFRHBA and congressional limitations.

Long Term Holding

Most horses that are not immediately adopted or sold would be transported to long-term holding (LTH) grassland pastures in the Midwest. Currently there are more than 45,000 wild horses and burros that are fed and cared for at short-term corrals and long-term pastures. (As of June 2012, there are 12,400 in corrals and 33,400 horses in Midwestern pastures.)

Potential impacts to wild horses from transport to adoption, sale or to LTH pastures are similar to those previously described. One difference is that when shipping wild horses for adoption, sale or LTH, animals may be transported for a maximum of 24 hours. Immediately prior to transportation, and after every 24 hours of transportation, animals are offloaded and provided a minimum of 8 hours on-the-ground rest. During the rest period, each animal is provided access to unlimited amounts of clean water and 2 pounds of good quality hay per 100 pounds of body weight, with adequate bunk space to allow all animals to eat at one time. The rest period may be waived in situations where the anticipated travel time exceeds the 24-hour limit, but the stress of offloading and reloading is likely to be greater than the stress involved in the additional period of uninterrupted travel.

Long-term grassland pastures are designed to provide excess wild horses with humane, and in some cases, life-long care in a natural setting off the public rangelands. The wild horses are maintained in grassland pastures large enough to allow free-roaming behavior and with the forage, water, and shelter necessary to sustain them in good condition. About 22,700 wild horses, that are in excess of the current adoption or sale demand (because of age or other factors such as economic recession), are currently located on private land pastures in Oklahoma, Kansas, and South Dakota.

Establishment of LTH pastures is subject to a separate NEPA and decision-making process. Located in mid or tall grass prairie regions of the United States, these LTH pastures are highly productive grasslands compared to more arid western rangelands. These pastures comprise about 256,000 acres (an average of about 10-11 acres per animal). Of the animals currently located in LTH, less than one percent are ages 0-4 years, 49 percent are ages 5-10 years, and about 51 percent are ages 11+ years.

Mares and sterilized stallions (geldings) are segregated into separate pastures (except at one facility where geldings and mares coexist). Although the animals are placed in LTH, they remain available for adoption or sale to qualified individuals. Foals born to pregnant mares in LTH pastures are gathered and weaned as necessary and are made available for adoption. The

LTH pasture contracts specify the care that wild horses must receive to ensure they remain healthy and well-cared for. Handling by humans is minimized, although regular on-the-ground observations are made by the LTH contractor and periodic counts are conducted by BLM personnel and/or veterinarians to ascertain the animals' well-being and safety. A very small percentage of the animals may be humanely euthanized if they are in very poor condition due to age or other factors.

Although horses residing on LTH facilities live longer, on the average, than wild horses residing on public rangelands, natural mortality of wild horses in LTH pastures averages approximately 8% per year, but can be higher or lower depending on the average age of the horses pastured there (GAO-09-77, Page 52).

Euthanasia and Sale without Limitation

While euthanasia and sale without limitation has been limited by Congressional appropriations, it is allowed under the *Wild Free-Roaming Horses and Burros Act of 1971* (as amended). Currently, neither option is available for healthy horses that are gathered under the Department of the Interior's fiscal year 2012 budgetary appropriations. It is unknown whether similar limits will be in place in fiscal year 2013.

4.2.4 Effects Common to Alternatives A and C Related to Fertility Control

Applying fertility control measures as part of the Proposed Action would slow the reproduction rates of mares that are returned to the HMAs following the gather. The intent is to slow the regrowth of the population to allow rangeland and riparian resources time to recover from grazing and trampling impacts. It would also decrease the frequency of additional gathers, which would reduce any potential disturbances to individual animals or to the herds. Reducing the number of gathers would also decrease the costs of BLM wild horse operations.

Under Alternatives A and C each released mare would receive a single-dose of the two-year PZP contraceptive vaccine. When injected, PZP (antigen) causes the mare's immune system to produce antibodies that bind to the mare's own eggs, and effectively block sperm binding and fertilization (Zoo Montana, 2000). PZP is relatively inexpensive, meets BLM requirements for safety to mares and environment, and can easily be administered in the field. PZP has been safely used by BLM as a contraceptive vaccine since 1992. In addition, among mares, PZP contraception appears to be completely reversible. Refer to Appendix B for more information about fertility control research procedures.

Mares vaccinated in the fall or winter would foal normally the next year. The efficacy for the summer application of the two-year PZP vaccine is as follows:

Year 1 0%

Year 2 80%,

Year 3 65%

Year 4 50%

This one-time application, applied at the capture site, would not affect normal development of the fetus, hormone health of the mare or behavioral responses to stallions, should the mare already be pregnant when vaccinated (Kirkpatrick, 1995). The vaccine has also proven to have no apparent effects on pregnancies in progress, the health of offspring, or the behavior of treated mares (Turner, 1997). Mares would foal normally in Year 1 after treatment.

Mares receiving the inoculation would experience slightly increased stress levels from increased handling while being inoculated and freeze marked. Injection site injury associated with fertility control treatments is extremely rare in treated mares, and may be related to experience of the administrator. Any direct impacts associated with fertility control would be minor in nature and of short duration. The mares would quickly recover once released back into their HMA.

4.2.5 Differences in Effects between Alternatives A and B

The Proposed Action (Alternative A) would treat wild horse mares in the Buckhorn and Coppersmith HMAs with fertility control in order to slow the current growth rate of the horse herd, estimated to be at 17 to 23% per year.

The adoption market for wild horses (even for young animals) has been greatly reduced in recent years, due to economic conditions, and the increased costs of hay and other expenses of keeping a horse. On the national scale there are about 33,100 horses within herd management areas, and about 45,000 animals in either short or long term pastures. Currently, the national wild horse herd is reproducing faster than the excess can be adopted by the public. If the number of wild horses gathered greatly exceeds the number that can be adopted, then the BLM would have to create additional short and long term pasture facilities, and this would continue to raise the costs of maintaining the BLM Wild Horse program. For these reasons, it has become very important to reduce the growth rate of the herds.

Alternative B would not involve fertility control, and would result in a post-gather sex ratio of approximately 50:50. Mares would not undergo the additional stress of receiving fertility control injections or freeze marking. Mares would foal at normal rates until the next gather is scheduled. Population modeling indicates annual growth rates of 15.0 to 16.9% per year. The primary difference between Alternatives A and B is the annual growth rates. Under the Proposed Action, median population sizes will be slightly lower over time than Alternative B, according to the population modeling (Appendix C). Growth rates under Alternative A are predicted to be a median rate of 10.0% in 10 years with the influence of fertility control compared to annual growth rates of 15.9% under Alternative B, with removal only.

Gathers to remove excess wild horses would still be required within 3-4 years under both alternatives; however the population modeling shows that the median number of animals needing to be removed over the modeling period is about 28% less (172 versus 237 horses removed) under the Proposed Action than Alternative B, due to the application of fertility control treatments. Median growth rates for the Proposed Action are approximately 37% less than those identified for Alternative B (10.0% versus 15.9%) according to the modeling. Refer to Appendix C for more detail.

4.2.6 Effects of Alternative C: Fertility Control Only

Under Alternative C the BLM would gather and remove wild horses from adjacent lands, but there would be no active management in the HMAs except fertility control to control the size of the wild horse populations, and the appropriate management levels would not be achieved. This alternative was modeled using a three-year gather/ treatment interval over a 10 year period (Appendix C). Based on this modeling, the current wild horse population would not only continue to exceed the established AML range, it would increase at a median population growth rate of 11.1 to 11.2%. These growth rates are lower than those for Alternatives B and D, because all reproductive mares would receive fertility control. However, the population of horses would continue to increase, as no wild horses would be removed from the HMAs.

Under Alternative C the population of wild horses for the two HMAs combined is predicted to be 268 to 789 animals in 10 years. Hence, this alternative would not result in attainment of the AML ranges for the HMAs, and would continue to increase the current wild horse overpopulation, albeit at a slower rate of growth. Since this alternative would not decrease the existing overpopulation of wild horses, impacts to resources would continue. Implementation of this alternative would result in high population levels that would increase stresses on wild horses, leading to lower foaling rates, increased social interaction between harems, and increased migration to areas outside the HMAs. See additional impacts in Section 4.2.8 below.

4.2.7 Effects of Alternative D

Under Alternative D the BLM would not gather or remove any wild horses from the Buckhorn or Coppersmith HMAs. The populations would continue to increase at a median rate of about 15.8 to 16.2% per year. Without a gather and removal in 2012, the combined wild horse population in the two HMAs would exceed 269 to 1202 head within ten years, based on the median population rate estimates. Implementation of this alternative would result in high population growth rates and resultant high population levels would increase stresses on wild horses, leading to lower foaling rates, increased social interaction between harems, and increased migration to areas outside the HMAs.

4.2.8 Effects Common to Alternatives C and D

Based on population modeling in Appendix C, Alternatives C and D would both result in large increases of populations over 10 years, and this could result in a crash to the populations. If no wild horses are removed from the HMAs, under Alternative C the median population would be 514 horses and the high population could be 789 horses.

The population model predicts that under Alternative D (No Action) the median population in the two HMAs would have a chance of ranging from 269 to 1202 wild horses by 2023, with a median value of 668 animals. Although Alternative D predicts approximately 29% more horses within 10 years than Alternative C, in actuality the populations of wild horses would be expected to crash long before these numbers would be reached, based on a lack of forage and water, and from extreme competition and stress to the animals. For this reason, the

effects from implementation of Alternative C and D are considered similar, and will be evaluated together in this document.

Well before the time that populations would crash, wild horses would be causing serious impacts to soil stability, vegetation, water sources (springs and creeks), and wildlife habitat. Wild horses would begin running out of forage and water, and would be in poor shape going into winter. At some point the population would crash, probably during an unusually cold or snowy winter, or during a year of drought.

Under Alternative C and D the increasing population of wild horses in excess of the AML would over-extend and deplete water and forage resources. The high range of the AML is defined as the maximum population at which a thriving ecological balance could be maintained, and that deterioration of rangeland resources could be avoided. Excessive utilization, trampling, and trailing by wild horses would degrade currently healthy rangelands, would prevent improvement of rangeland that is already in a lowered condition, and would not allow for sufficient availability of forage and water for either wild horses or other animals, especially during drought years or severe winter conditions.

Movement outside the HMAs by wild horses would be expected as greater numbers of animals search for food and water for survival, thus impacting larger areas of public lands. Heavy to excessive utilization of the available forage would be expected and the water available for use could become increasingly limited. Eventually, plant communities would be damaged to the extent that they are no longer sustainable and the wild horse population would be expected to crash. Under Alternative C there would be short-term impacts to vegetation and soils from the gather operations, as discussed above. Under Alternative D there would be no short term impacts from gather operations.

Emergency removals could be expected in order to prevent individual animals from suffering or death as a result of insufficient forage and water. These emergency removals could occur as early as 2012. During emergency conditions, competition for the available forage and water increases. This competition generally impacts the oldest and youngest horses as well as lactating mares first. These groups would experience substantial weight loss and diminished health, which could lead to their prolonged suffering and eventual death. If emergency actions are not taken, the overall population could be affected by severely skewed sex ratios towards stallions as they are generally the strongest and healthiest portion of the population. An altered age structure would also be expected.

There are only two predator species within the Buckhorn and Coppersmith HMAs that potentially help to control wild horse populations. Some mountain lion predation occurs, but does not appear to be substantial. Coyote are not prone to prey on wild horses unless young, or extremely weak. Other predators such as wolf or bear do not exist in the HMAs. Wild horse survival rate is relatively high: greater than 95% for foals, and 92-93% for horses from 1 year to old age.

4.2.9 Cumulative Impacts Summary for Wild Horse and Burros – Alternatives A and B

Cumulative effects expected when incrementally implementing either Alternative A or B to the Cumulative Assessment Area for wild horses (Buckhorn and Coppersmith HMAs) would include continued improvement of upland and riparian vegetation conditions, soil resources, and rangeland health. These improvements would in turn benefit permitted livestock grazing, native wildlife and habitats, and wild horse populations, as forage (habitat) quantity and quality is improved over the current levels. Benefits from reduced wild horse populations would include fewer animals competing for limited water quantity, and at limited sites. Cumulatively there should be more stable wild horse populations, healthier rangelands, healthier wild horses, and fewer multiple use conflicts within the cumulative area over the short and long-term. Gathering and removing excess wild horses from the two HMAs, combined with anticipated changes to livestock grazing practices to achieve Land Health Standards would also likely benefit resources on public lands in the Surprise Field Office. Gathering and removing excess wild horses would allow the BLM to gather wild horses that have moved outside of a specific HMA during gather operations and increase the gather success rate. This would increase the likelihood that wild horses populations would be managed within the established AMLs for the HMAs.

Cumulatively over the next 10-15 year period, continuing to manage wild horses within the established AML range would result in improved vegetation conditions (i.e. forage availability and quantity), which in turn would result in improved vegetation density, cover, vigor, seed production, seedling establishment, and forage production over current conditions. Primary forage plant species would be expected to recover to a healthy and vigorous state more rapidly, and riparian sites and habitats would improve in condition. Maintaining AMLs over a sustained period of time would allow for the collection of scientific data to evaluate whether any changes to the current AML levels are warranted.

Cumulatively over the next 10-15 years, fewer gathers would need to occur, which would result in less frequent disturbance to individual wild horses and the herd's social structure. Individual horse and herd health would be maintained. Some movement of wild horses across HMA boundaries would be expected to continue. However, even with this movement, it is expected that attainment of populations within the AML ranges and other management objectives would be possible, as excess horses are removed from near or the adjoining HMAs.

The ability to gather a higher percentage of the total population in future gathers (due to smaller numbers of excess wild horses relative to the current over-population) would allow for the increased use of fertility control in an effort to slow population growth. However, return of wild horses/burros back into the HMA may lead to the decreased ability to gather horses/burros in the future, as released horses/burros learn to evade the helicopter.

4.2.10 Cumulative Impacts Summary for Wild Horses and Burros - Alternatives C and D

Under Alternative D (No Action), the wild horse population in the Buckhorn and Coppersmith HMAs would exceed 668 horses within 10 years, based on current populations and annual reproduction rate estimates. Under Alternative C the population of wild horses

would be approximately 514 horses within 10 years. Increased movement of horses outside the boundaries of the HMAs would be expected, as higher numbers of wild horses would need to search for sufficient resources and habitat for survival, thus impacting larger areas of public lands. Heavy utilization of available forage and insufficient drinking water would be expected. Allowing the wild horse populations to continue to grow beyond the current numbers would likely result in a population crash during the next decade. Wild horses, wildlife, and livestock would not have sufficient forage or water. This would exacerbate the deterioration in rangeland and riparian/wetland conditions documented at the current level of the wild horse populations. This would result in the depletion of forage and water resources that would eventually lead to a decline of the body condition of the horses, ultimately resulting in catastrophic losses to the herds.

Wild horses are not self-regulating species, and they would continue to reproduce until their habitat could no longer support them. The condition of the habitat would become severely damaged before the wild horse populations would show substantial death loss. Prior to the ultimate collapse of herds, wild horses would be subject to increasing levels of stress associated with overcrowding and decreased forage availability. Reproductive rates would decline and migration rates to areas outside the HMA would increase.

Loss of wild horses due to starvation or lack of water would have obvious consequences to the long-term viability of the herds. The BLM would be violating several policies, including the WFRHBA, by allowing this to occur. Continued decline of rangeland health and irreparable damage to vegetation, soil and riparian resources, would have obvious impacts to the future of the land within the HMAs, and all other users of the resources, which depend upon them for survival and would also be contrary to statutory mandates to manage for healthy public rangelands. As a result, Alternatives C and D would not ensure healthy rangelands that would allow for healthy, self-sustaining wild horse populations, and would not promote a thriving ecological balance.

While some members of the public have advocated "letting nature take its course", allowing wild horses to die of dehydration and starvation would be inhumane treatment and would be contrary to the WFRHBA, which mandates the removal of excess wild horses. In addition the WFRHBA mandates the humane treatment of the animals. The damage to rangeland resources that results from excess animals is also contrary to the WFRHBA, which mandates the Bureau to "*protect the range from the deterioration associated with overpopulation*", "*remove excess animals from the range so as to achieve appropriate management levels*", and *"to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area".*

Promulgated Federal Regulations at Title 43 CFR § 4700.0-6 (a) state "*Wild horses shall be managed as self- sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat"* (emphasis added). Allowing excess wild horses to remain within the HMAs would be inconsistent with the mandates of the WFRHBA.

Ecological communities and habitat resources would not be sustainable if the excess wild horses remain on the range and continue to increase in population size. Rangeland health

would degrade, possibly below biological thresholds, making recovery unlikely, if not impossible, as cheatgrass, medusahead, and other invasive non-native species dominate the understory, degrading ecological conditions.

Cumulative impacts would result in foregoing an opportunity to improve rangeland health and to properly manage wild horses in balance with the available water and forage. Over-utilization of vegetation and other habitat resources would occur as wild horse populations continued to increase. Wild horse populations would be expected to eventually crash at some ecological threshold; however wild horse, livestock, and wildlife would all experience suffering and possible death as rangeland resources continued to degrade. Attainment of resource objectives that are outlined in BLM land use plans and Standards for Rangeland Health and Wild Horse Populations would not be achieved.
The numbers or wild horses would continue to be above the AMLs and therefore the collection of scientific data necessary to evaluate the current AML levels, in relationship to rangeland health standards and thriving natural ecological balance being met or achieved, would not be possible since monitoring would demonstrate the impacts of excess numbers of wild horses, not whether additional forage or water is available for wild horses when their population is managed within the established AML ranges.

4.3 Effects on Cultural Resources

4.3.1 Effects of Alternative A (Proposed Action) and Alternative B

The Proposed Action and Alternative B would result in a decrease in disturbance to cultural resources by substantially reducing the numbers of wild horses within the Buckhorn and Coppersmith HMAs for at least four years. Impacts to cultural sites from trampling and displacement by wild horse hoof action and deflation caused by 'rolling' would be reduced. Impacts to springs and riparian cultural sites would be also reduced beginning the first year following the gather. Indirect impacts to cultural resources would be reduced in riparian zones where concentrations of wild horses can lead to modification and displacement of artifacts and features, as well as erosion of organic middens containing valuable information. Vegetation cover would improve, and cultural resource sites would be afforded more protection.

No direct impacts to cultural resources, beyond those experienced on a daily basis, are expected as a result of the gather operations. Use of the individual capture sites for brief periods of time will limit exposure of cultural resources to impacts no different than every day activities by the animals. The potential locations identified for use as capture sites and holding areas will be inventoried for cultural resources prior to use. Any capture location that includes cultural resources will be evaluated to determine if use of that location will be permitted. Cultural resource sites with sufficient ground cover may be used for capture purposes, but not for long term holding. The BLM archaeologist will make individual determinations of suitability of each proposed capture location prior to the gather.

Impacts to soils and vegetation within the holding areas are expected to be high from animals standing, running, and trampling within the holding pens. To avoid impacts to cultural

resources, each potential holding area will be examined for cultural resources, and there will be no placement of holding facilities where cultural resources are located.

4.3.2 Effects of Alternative C and Alternative D

Under Alternative C and D excess animals would not be removed from the two HMAs, wild horse numbers would continue to increase each year, and numbers would continue to be above the high AML range. Impacts to water sources and riparian areas would continue and increase, which would allow further adverse impacts to cultural sites in the vicinity of the water sources. Overgrazing of upland areas where cultural resources are located place such resources in danger of complete destruction as the vegetation cover is reduced and removed. Alternatives C and D would result in an immediate increase in disturbance to cultural sites, including trampling and displacement by wild horse hoof action and deflation caused by 'rolling'. Soils would continue to become trampled and compacted where animals concentrate, increasing runoff and subsequently increasing erosion. This would result in modification and displacement of artifacts.

4.3.3 Cumulative Impacts to Cultural Resources

Since many Great Basin prehistoric sites are on the surface or near surface sites, any ground disturbing activities destroy site integrity, spatial patterning, and site function. Datable organic features are either destroyed or contaminated. Previous activities within the Buckhorn and Coppersmith HMAs, including localized grazing, development of range improvements, road construction/maintenance, prescribed, natural, and human caused fire, and use of gravel pits have caused these types of impacts to cultural resources.

Grazing by livestock and wild horses has probably affected a larger number of sites than is documented. By removing excess wild horses as described in the Proposed Action and Alternative B, vegetation health and cover will improve, trampling, rolling and wallowing by wild horses will be reduced, and protection of cultural resources will be improved.

The continued overuse by wild horses without the removal of excess animals in the two HMAs, as would occur under Alternatives C and D, would result in ever increasing impacts to cultural resources, especially in areas adjacent to water. Overgrazing of uplands and riparian/wetland sites would occur, and this combined with past actions of wildfire and historic heavy livestock grazing, would likely cause some plant communities to become degraded to the point of crossing an ecological threshold, with a limited amount of plant litter and cover, thereby affording little to no protection to cultural sites. Riparian sites or wetlands which are still recovering from the damage caused by past heavy livestock grazing use would likely become so damaged as to lose the entire structure, function, and integrity of the water source. Smaller sites would likely become nonfunctional and dry up, with a high amount of damage to cultural resources through breakage, displacement, and loss of site integrity.

4.4 Effects on Livestock Grazing

4.4.1 Effects of Alternative A (Proposed Action) and Alternative B

Wild horses compete directly with livestock for available forage and water in areas where they graze in common. In addition to removing excess wild horses, implementation of the Proposed Action would result in lower wild horse population growth rates, and allow for a longer period of time when wild horse numbers are within the established AML range. Alternatives A and B would have a beneficial impact on livestock operations compared with the other alternatives, and on the social and economic values associated with livestock grazing. Grazing systems for individual allotments are designed to function in balance with wild horse numbers at the established AML range. Since these alternatives would retain the established AMLs, livestock operations and grazing systems would function properly, and forage plants would receive rest from grazing during scheduled rest periods.

During the timeframe of the gather operations for Alternatives A and B livestock would be directly impacted by the helicopters presence. The impact is expected to be short in duration as the helicopter moves through an area and would consist of displacing livestock from their desired location.

4.4.2 Effects of Alternatives C and D

Implementation of Alternatives C and D would result in substantial increases in wild horse numbers, and competition for forage and water would become more prevalent between livestock and horses. As wild horse numbers increase, their utilization of forage and water sources increases. These impacts would be greatest where wild horses tend to congregate; however, when wild horse numbers become excessive, the impacts would also become noticeable on the upland slopes at greater distances from water and trail corridors. Once grasses became utilized heavily (>60% use) for forage, and continuously for 12 months each year, soils would become trampled and compacted; plant vigor, production, and diversity would be reduced; and livestock forage production would be degraded and diminished.

Livestock operators are often required to take voluntary non-use or reduced use of their permits during periods of drought. The current wild horse population is approximately 1.5 to 2.9 times above their forage allocation. Heavy to severe utilization is occurring in some areas. The indirect impacts of Alternatives C or D would be continued damage to the rangeland, continuing competition between wildlife, livestock, and wild horses for the available forage and water, reduced quantity and quality of forage and water, and undue hardship on the livestock operators who would continue to be unable to fully use the forage they are authorized to use.

Under Alternative C there would be short-term impacts to vegetation and soils from the gather operations, as discussed above. Under Alternative D there would be no short term impacts from gather operations.

4.4.3 Cumulative Effects to Livestock Grazing

Through the land-use planning process and grazing permit renewal decisions, livestock grazing permits have been set at levels that balance forage use between livestock and wild horses. The terms and conditions of livestock grazing permits are designed to allow forage resources to rest from grazing at various times of each year and to ensure that plants have adequate time for regrowth after grazing. When wild horse numbers become higher than the established AML, overall impacts to forage resources are higher, as more forage is consumed in the same time periods. This does not allow the livestock grazing systems to function as they have been designed, as in actuality, no rest occurs on forage plants after livestock are removed from the allotment, since they are continuously grazed by higher numbers of wild horses than the range can sustain.

By managing wild horses as described in the Proposed Action and Alternative B, livestock operations and grazing systems would function properly, and forage plants would receive rest from grazing during scheduled rest periods. The health and condition of vegetation will be maintained, and plant communities that have been impacted by wildfires or past heavy livestock grazing would continue to improve in condition. Forage quality and production for livestock grazing would be expected to be maintained.

Implementation of Alternatives C and D would result in substantial increases in wild horse numbers, and competition for forage and water would become more prevalent between livestock and wild horses. Plant communities that are still recovering from the effects of wildfires or past heavy livestock grazing would be the most vulnerable to being degraded further. As wild horse numbers become extremely high (up to 1,202 animals) plant communities would experience a serious decline in condition, forage quality, and production. Forage resources for livestock would be highly degraded, and changes to grazing permits would most likely need to be made because of declining rangeland health.

4.5 Effects on Noxious Weeds and Invasive Species

4.5.1 Effects of Alternative A (Proposed Action) and Alternative B

Grazing by wild horses can contribute to the establishment and expansion of noxious weeds and invasive species through various mechanisms. Overgrazing can cause a decline in desirable native plant species and ground cover, which provides a niche for noxious weed invasion. In addition, weed seeds can be transported and introduced to new areas by fecal deposition or by seeds that cling to an animal's coat. Conversely, more moderate levels of grazing, which do not create areas of bare ground, and which maintain the vigor and health of native plant species, particularly herbaceous species, is not expected to cause a substantial increase in noxious weeds or invasive species.

Indirect, long-term impacts are related to the wild horse population sizes and growth rates associated with each of the Alternatives. Wild horses utilize primarily herbaceous vegetation and impacts would generally be associated with trampling and compaction of soils, especially during wet periods. There is a corresponding increase in utilization of vegetation and increase

of soils impacts with population size. At congregation areas, plant vigor, production, and diversity are reduced and overall ecological site conditions are reduced. Disturbed areas and areas in poor ecological condition are much more susceptible to having noxious weeds and invasive non-native species populations establish and expand in size. Since Alternatives A and B would bring the number of wild horses to within the established AML range, this would reduce the risk of overgrazed rangelands, thereby reducing the risk of spread of noxious weeds and invasive species.

Direct impacts to existing noxious weed areas are not anticipated to occur in gather sites and temporary holding facilities, because these areas would not be located on infested sites. If weeds are encountered, these locations would not be utilized unless they could be treated to control noxious weed transfer off site.

4.5.2 Effects of Alternatives C and D

Direct impacts to existing noxious weed areas from gather operations for Alternative C would be the same as for Alternatives A and B. There would be no direct impacts from gather operations for Alternative D. However, implementation of Alternatives C and D would increase wild horse numbers, and result in a higher amount of disturbance to native vegetation and soils, which could lead to new infestations of noxious weeds and invasive species. Invasive plants generally germinate and become established in areas of surface disturbing activities, such as roads and construction sites, and areas overgrazed by wild horses and/or livestock. Riparian and wetland sites that have been damaged in the past by historic livestock grazing, and are now being overgrazed and trampled by wild horses, would be very vulnerable to invasions of invasive species, due to the high amount of surface disturbance. Under Alternative C there would be short-term impacts to vegetation and soils from the gather operations, as discussed above. Under Alternative D there would be no short term impacts from gather operations.

4.5.3 Cumulative Effects to Noxious Weeds and Invasive Species

The Buckhorn and Coppersmith HMAs contains several areas where vegetation has been impacted by historic livestock grazing, and other disturbances, and which now have infestations of noxious weeds and other undesirable species. Maintaining a balance of grazing animals, consistent with the multiple use apportionments determined through prior decisions, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses, is crucial to preventing the spread of these weeds and to prevent new infestations from occurring. By managing wild horses as described in the Proposed Action and Alternative B, and continuing annual treatments and monitoring of noxious weeds and invasive species, the BLM would be able to curtail the spread of noxious weeds and invasive species, and beneficial cumulative impacts are expected.

Implementation of Alternatives C and D would increase wild horse numbers, and result in a high amount of disturbance to native vegetation and soils, which could lead to new infestations of noxious weeds and invasive species. Plant communities which have been impacted in the past by historic livestock grazing would continue to be very vulnerable to new

invasions of noxious weeds and other invasive species, due to the high amount of surface disturbance. Cumulative impacts would be a higher rate of spread of invasive weeds into new areas, and the expansion of areas already infested.

4.6 Effects on Riparian/Wetland Sites

Grazing by livestock and wild horses has the potential to impact riparian/wetland associations through trampling and/or grazing of riparian vegetation. Some localized overuse of forage can occur in riparian and wetland sites and near water sources due to the higher quality and longer growth period of forage, compared to adjoining upland areas. However, the risk of such impacts becomes much higher as animal numbers and/or grazing season of use are increased. When forage plants are overused, desirable native species can be replaced by less desirable species that produce little or no forage value. Since wild horses graze year round, they are more likely to damage riparian areas and spring sites in late summer and fall, when there is little green forage available in the uplands. Wild horse harems within the Surprise Field Office have been documented to limit their hot season use to areas within 1.75 miles of water sources (Sager, 1992). A decline in soil condition, plant cover, and plant species composition from trampling and overgrazing can encourage the invasion and growth of noxious weeds or other invasive plants in riparian sites. Early spring grazing can also adversely affect vegetation resources as a result of trampling of wet soils, uprooting of seedlings, and damage to mature plants.

Riparian functional assessments completed in 2010 have determined that most riparian sites within the Buckhorn and Coppersmith HMAs are "Functional at Risk" (66%), and several other sites (17%) are rated as "Nonfunctional". This means that the majority of sites are in an obvious degraded condition. Sites rated as FAR are in danger of becoming "Nonfunctional" if the stresses and disturbances causing these conditions are allowed to continue. The dominant causal factors for riparian and wetland sites not being rated as PFC is grazing and trampling from livestock and wild horses. Some sites have recorded causal factors for not achieving PFC as continuous, year round use by wild horses.

4.6.1 Effects of Alternative A (Proposed Action) and Alternative B

Alternatives A and B are designed to improve and protect streams (and associated riparian and wetland communities) by managing wild horses within established appropriate management levels. This would curtail the current impacts to many riparian and wetland sites from high utilization rates, continuous grazing, and ground disturbance from wild horse use, and bring such use to levels that allow for recovery of riparian areas, and allow for greater production of vegetative cover within riparian plant communities. Many of the riparian/ wetland sites are rated as having a downward/or static trend and are moving towards a "Nonfunctional" condition. Decreasing wild horse numbers and reductions in yearlong wild horse impacts would result in decreased grazing use, which would provide opportunities for riparian recovery and improvements in riparian function.

Enhanced conditions of sites within the HMAs would include increased vigor and production of individual riparian species, increased soil stability, and additional amounts of plant cover and litter. The quality of drinking water for animals would be improved in spring sites by a

reduction of sediment in the water. Reduced amounts of headcutting and soil erosion would also occur under Alternatives A and B due to increased residual vegetation and overall plant cover. Dewatering of riparian areas would also be reduced compared to current conditions due to decreased erosion and alteration of soils within riparian zones; which would provide increased water for plant growth and livestock, wildlife, and wild horse consumption.

4.6.2 Effects of Alternatives C and D

Under Alternative C and D wild horse numbers above AML would be large enough to be causing increased pressure to and decreased functionality of riparian areas throughout the HMAs. The overall impact to riparian resources would increase as wild horse numbers continue to increase. Riparian Functional Assessments conducted in 2010 revealed that some riparian/wetland sites, especially lentic sources, are being adversely impacted as a result of year-long wild horse use. Without a decrease in wild horse numbers, it is likely that the functional ratings of riparian areas will decrease, and many riparian areas will eventually become "Nonfunctional" riparian systems. Hummocking and soil alteration within riparian zones would continue unabated and result in decreased quality and function of riparian areas.

Implementation of Alternative C or D would result in continuing degradation of numerous riparian/wetland sites within the HMAs that are currently being impacted by high utilization by wild horses. Riparian/wetland sites that are currently in PFC could also be downgraded to FAR as wild horse numbers and impacts increase. Impacts include decreased size, vigor and production of individual species, increased soil erosion, and a reduction in plant cover and litter. The drinking water for animals would be of low quality due to the amount of sediment in the water and fecal coliform. As increased utilization and yearlong impacts from wild horses occurred, erosion and headcutting within riparian zones would increase due to reductions in residual vegetation and plant cover. Increased headcutting would threaten the function of many riparian areas within the HMAs and could result in deterioration of riparian function that would provide few benefits to wild horses, livestock, wildlife and human users.

Under Alternative C there would be short-term impacts to vegetation and soils from the gather operations, as discussed above. Under Alternative D there would be no impacts from gather operations.

4.6.3 Cumulative Effects to Riparian/Wetland Sites

The number of wild horses in the Buckhorn HMA has been above the established AML range for at least 8 of the past 10 years. The number of wild horses in the Coppersmith HMA has been above the established AML range for at least 4 of the past 10 years. Results from Riparian Functional assessments completed in 2010 indicate that riparian/wetland sites, especially lentic sources, are being adversely impacted by year-long wild horse use. By managing wild horses as described in the Proposed Action and Alternative B, it is expected that some sites rated as "Functional at Risk" will have the opportunity to recover and improve in condition, and beneficial cumulative impacts are expected. Sites currently rated as PFC would be able to maintain that condition. "Nonfunctional" riparian areas may improve also, however recovery would be slow and limited due to the amount of damage that has already

occurred.

Implementation of Alternative C or D would allow for an over-population of wild horses and for increasing numbers of wild horses above the established AML range. Without a decrease in wild horse numbers, it is likely that the functional ratings of riparian areas will decrease, and in some cases riparian areas could rapidly degrade to a "Nonfunctional" state. Soil loss and alteration of soil structure would increase under the No Action Alternative and recovery of many riparian areas within the HMAs would become severely hindered, if not impossible, due to physical changes to soil structures resulting in permanently dewatered riparian areas.

Riparian areas that are already recovering from past overgrazing could become de-watered (reversing improvements that have been made over time as a result of changes in livestock grazing management), as the vegetation converts from riparian dominated vegetation to upland species. If these changes occur, water sources will stay wetter for a shorter period of time, and stand the chance of converting from surface flow (which serves as a water source for wild horses, livestock and wildlife) to sub-surface flow that is unavailable for drinking water. This would result in increased impacts on remaining spring sources, as animals would concentrate in ever higher numbers on the remaining available drinking water sites.

4.7 Predicted Effects on Soil Resources

4.7.1 Effects of Alternative A (Proposed Action) and Alternative B

Managing the populations of wild horses to within the established AML range would reduce damage to soils in areas where trampling and overgrazing of vegetation is occurring. The Upland Soils Standard is being met for most assessment sites in the Tuledad Allotment within the Buckhorn and Coppersmith HMAs based on the 1999 land health determination. However recent assessment indicate that many lower elevation sites are rated as "Moderate" for Soil Stability, Litter Amount, and Annual Production, and a "Moderate to Extreme" rating was given for Functional/Structural Groups. These sites have lost a large portion of the native perennial bunchgrasses that should be present at the site, resulting in an increase of smaller bunchgrasses such as Sandberg's bluegrass. There are also several areas that have been invaded by cheatgrass and medusahead, and have lost their soil structure. These plant communities are very vulnerable to additional disturbance from overgrazing, and would benefit from a reduced amount of grazing, especially year-long grazing.

Managing the number of wild horses within the established AML would benefit these sites by preventing additional loss of cover and litter, and by reducing the amount of bare ground which makes sites susceptible to soil erosion. In addition, reducing the number of animals grazed per year would result in long-term benefits to soil because increased runoff from direct trampling would be avoided. Removal of wild horses from areas outside the HMAs would remove the incremental impact on soils caused by wild horses in areas that are not allocated for wild horse use.

Alternatives A and B would result in short term impacts to soils within the gather site locations and temporary holding facilities. The disturbance area for each trap site would be 1

to 3 acres in size, and up to 5 acres for a temporary holding area. However, many of these areas were specifically chosen for gather operations because they are previously disturbed sites. Soils within these sites will likely become devoid of vegetation and be susceptible to soil erosion, however these areas are of limited size and are expected to recover within a short period of time. The short term effects to soils within these gather and holding sites is outweighed by the long term beneficial impacts to soil resources that would occur as a result of managing wild horses to within the established AML ranges.

4.7.2 Effects of Alternatives C and D

Short-term impacts to soils at capture sites and temporary holding facilities would be the same for Alternative C as for Alternatives A and B. There would be no short-term impacts under Alternative D from gather operations. However, implementation of Alternative C or D would result in an increase in wild horse numbers, which would increase the level of disturbance to vegetation and soils. The increase in wild horse numbers would lead to increases in movement of horses outside the HMAs, resulting in adverse impacts to soils in a larger area as wild horses expand their ranges into areas not currently occupied by horses. High vegetative utilization levels (>60%) as a result of livestock grazing or wild horse use in areas with sensitive soil types can degrade these soils in both the short and long term through soil compaction, erosion, sedimentation, and degradation of stream channel conditions (Fleischner 1994). Within the Buckhorn and Coppersmith HMAs soil compaction and erosion occur in areas where livestock and wild horses concentrate (e.g., watering areas, salt licks, fencelines, and corrals) and vegetation has been reduced or removed. While there currently are not many observable severe impacts to upland soil resources within the HMAs as a result of wild horses, as wild horse numbers continue to increase, the number of sites that would not be meeting the Upland Soils Standard would increase across the HMAs. This would occur due to increased impacts on vegetation, as well as impacts from animals congregating in certain areas as their numbers increase. This would result in the loss of vegetative cover and litter to protect soil surface, a decrease in biological soil crusts, and an increase in soil erosion and compaction.

4.7.3 Cumulative Effects to Soil Resources

As stated above, the Upland Soils Standard is being met for most sites within the Buckhorn and Coppersmith HMAs; however recent assessments indicate sites rated as "Moderate" for *Soil Stability*, *Litter Amount*, and *Annual Production*, and "Moderate to Extreme" for *Functional/ Structural Groups*. These sites have an altered and often degraded plant community, and have experienced a loss of perennial bunchgrasses, and an increase in annual grasses, short grasses, or invasive species, resulting from past heavy livestock grazing. Managing the population of wild horses to within the established AML range under Alternative A or B would reduce the damage to soils resulting from trampling and overgrazing of vegetation. Sites that are currently altered and degraded would be allowed to recover from past overgrazing, and beneficial cumulative impacts are expected.

Under Alternative C or D, wild horse populations would continue to increase and it is likely that areas currently rated as "Moderate" or "Moderate to Extreme" for certain criteria of the

Upland Soils Standard will continue to decline in condition fairly rapidly. Within three years these sites would be experiencing the cumulative effects of wild horses being above the high AML range for approximately eight years. More upland sites would become overgrazed by wild horses, resulting in the loss of vegetative cover and litter to protect the soil surface, as well as a decrease in biological soil crusts, and increases in soil erosion and compaction. Sites that now contain a high amount of annual and invasive species would experience more degradation, and eventually cross an ecological threshold to a plant community with very few native perennial species. These degraded sites typically produce lower amounts of plant biomass and cover, are dominated by plants with shallow root systems, and provide little soil stability.

4.8 Effects on Special Status Plants

4.8.1 Effects of Alternative A (Proposed Action) and Alternative B

Grazing by livestock and wild horses can adversely affect occurrences of special status plants in several ways. Grazing removes plant material and may prevent flowering and fruiting. Trampling can damage or destroy individual plants. Trampling can also affect the habitats of special status plants, through compaction of the soil or damage to streambanks. Grazing may actually benefit some plants by removing or reducing the vigor of competing plants, and by preventing the establishment of shrub cover in open herbaceous habitats.

Implementation of Alternative A or B would manage the population of wild horses to within the established AML range, which would reduce the risk of damage to special status plants from overgrazing and trampling by wild horses. Specifically, risks to Schoolcraft's cryptantha would be decreased due to less wild horse trailing on the barren outcrops that this species occupies.

There would be no direct impacts to special status plants at trap sites or temporary holding areas, as these areas have been selected outside of the locations of known populations or habitats.

4.8.2 Effects of Alternatives C and D

Implementation of Alternative C or D would result in an increase in wild horse numbers, which would increase the level of disturbance to vegetation and soils, and increase the risk of damage to special status plants. Specifically, disturbance associated with wild horse trailing would likely increase on Schoolcraft's cryptantha habitats. Under Alternative C there would be no direct impacts to special status plants at trap sites or temporary holding areas, as these areas have been selected outside of the locations of known populations or habitats. There would be no impacts to special status plants from gather operations under Alternative D.

4.8.3 Cumulative Effects to Special Status Plants

The Buckhorn and Coppersmith HMAs contains several areas where vegetation has been impacted by past livestock grazing and other disturbances, which have caused damage to

plant communities. Many areas have lost a high percentage of their native herbaceous component, and are comprised of a higher percentage of shrubs, which can adversely impact some special status species. Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to maintaining populations of special status plants that occur in the Buckhorn and Coppersmith HMAs. By managing wild horses as described in the Proposed Action and Alternative B, and providing additional protection to special status plants when conditions warrant, no cumulative impacts are expected.

Implementation of Alternative C or D would increase wild horse numbers, and result in a high amount of disturbance to native vegetation and soils, which could lead to more damage to special status plants. Plant communities which have been impacted in the past livestock grazing would be very vulnerable to loss of populations of special status plants, due to the high amount of surface disturbance and trampling.

4.9 Effects on Upland Vegetation

Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to maintaining healthy upland plant communities. Plant communities that have been impacted by past livestock grazing practices are very vulnerable to losing more of their native perennial grass component, when grazed at higher than moderate utilization levels (>60%). Sites that are already close to crossing an ecological successional threshold to annual species, or sites that are adjacent to water sources are the most vulnerable. While many upland communities are in a healthy condition, some sites are already experiencing increased grazing pressure from wild horse numbers in excess of the high AML range, and are in danger of being in a downward trend. The increased amount of grazing on the uplands from an excess number of wild horses will not allow some upland sites to get the amount of rest they need to recover from past disturbances. If these upland communities are grazed excessively, they will decrease in soil stability, biodiversity, vigor, and production.

4.9.1 Effects of Alternative A (Proposed Action) and Alternative B

Under the Proposed Action or Alternative B, the numbers of wild horses would be managed within the established AML range, which would result in decreased impacts to vegetation throughout the HMAs. Buckhorn and Coppersmith HMAs contains several areas where upland vegetation has been impacted by past livestock grazing practices and other disturbances, which have degraded native plant communities. While most areas in the Buckhorn and Coppersmith HMAs exhibit healthy soils, and appear to meet the Upland Soils Standard, some areas have altered native plant communities from past disturbances, and would not meet the Biodiversity Standard. Sites that have low biodiversity have lost a high percentage of their herbaceous perennial plant component, and are comprised of a higher percentage of shrubs and short grasses, or have been invaded by annual grasses. These sites typically produce lower amounts of biomass, forage, and cover.

While the removal of excess wild horses may not be able to restore plant communities that have crossed an ecological threshold to shrubs, short grasses, or annual species, having an

appropriate number of wild horses in the HMAs would help prevent areas becoming dominated by invasive species. The removal of grazing pressure from excessive numbers of wild horses would lessen the impacts to perennial grasses, thus allowing them to better recover from natural disturbances, and to compete with non-native annual species.

There would be some short term direct effects upon the vegetation within the gather sites and temporary holding facilities. Each of the gather sites is expected to be used for only a short duration (1-10 days) and at a level of use where effects would be short term. Holding sites would be used for 1 to 30 days. In all trap and holding sites vegetation is expected to be trampled by the animals, with some plants likely becoming uprooted, but the area impacted would be small. The disturbance area for each trap site would be 1 to 3 acres in size, and up to 5 acres for a temporary holding area. However, many of these areas were specifically chosen for gather operations because they are previously disturbed sites. Annual vegetation will have already set seed for the season, so the effects would be greater to the perennial species, such as bunchgrasses and shrubs. This short term effect is outweighed, however, by reducing the long term impacts to vegetation from heavy grazing by high numbers of wild horses (above AML) on the upland vegetation.

4.9.2 Effects of Alternatives C and D

Implementation of Alternative C or D would result in a continued increase in the number of wild horses above the high AML, which would have compounding impacts upon upland vegetation. Since most sites within the HMAs are currently meeting standards for Upland Soils, but are not meeting the stream health based on the 1999 land health determination, impacts will not likely become widespread throughout the HMAs until wild horse numbers increase to a point where the animals can no longer sustain themselves on the range. Impacts would be seen first in sites that are already close to crossing an ecological successional threshold, or on sites that are closer to water sources. The increased grazing pressure from wild horse numbers in excess of the high AML would result in a decrease in native perennial species, and an increase in non-native annual species or shrubs tolerant of disturbance, such as cheatgrass and rabbitbrush. These changes would decrease the stability, biodiversity, vigor, and production of native plant communities within the HMAs. Direct effects to vegetation at capture and holding sites under Alternative C would be the same as those listed above for Alternatives A and B. There would be no direct effects to vegetation from gather operations under Alternative D.

4.9.3 Cumulative Effects to Upland Vegetation/Land Health Standards

The Buckhorn and Coppersmith HMAs contains several areas where upland vegetation has been impacted by past livestock grazing and other disturbances, including wildfire, which have damaged those plant communities. Sites that have low biodiversity have lost a high percentage of their herbaceous component, and are comprised of a higher percentage of shrubs and short grasses, or have been invaded by annual grasses. Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to maintaining healthy upland plant communities. By managing excess wild horses as described in the Proposed Action and Alternative B,

beneficial cumulative impacts are expected. Implementation of Alternative C or D would allow for a continued increase in wild horse numbers, and result in a high amount of disturbance to native vegetation and soils, which could lead to more damage to upland vegetation. Plant communities that have been impacted in the past by livestock grazing would be very vulnerable to losing native perennial grasses, due to the high amount of surface disturbance and trampling.

As the percentage of perennial plant cover decreases within the HMAs, the amount of annual plant cover from invasive species would increase under Alternative C or D, as these species are adapted to filling in gaps (areas devoid of vegetation) when such gaps occur. This change in functional/structural groups will have an impact upon not only the vegetation and forage resources in the HMAs, but on the soil resources as well. Soils would become less resistant to trampling impacts and would become more susceptible to wind or water erosion. Many sites that have undergone previous disturbance would transition from plant communities dominated by native perennials to ones dominated by invasive annuals such as cheatgrass. The biodiversity and productivity of these sites would decrease substantially.

4.10 Effects on Native Wildlife and Sage-Steppe Habitats

4.10.1 Effects of Alternative A (Proposed Action) and Alternative B

Local habitat disturbance would occur at trap sites and temporary holding facilities under the Proposed Action and Alternative B, however due to the small size of trap sites (about 3 to 5 acres) and that they typically are located on existing roads or other disturbed areas, the effects of using these sites are expected to be slight. Trap sites and temporary holding facilities will be surveyed for the presence of BLM sensitive species, Federally Threatened or Endangered Species, and Candidate species prior to approval for use. If any BLM sensitive species, Federally Threatened or Endangered Species, or Candidate species is detected, mitigation measures and BLM Standard Operating Procedures for trap sites will be employed to minimize effects on species, including potentially moving sites to another location to mitigate or avoid impacts.

Localized disturbance and temporary displacement of wildlife could occur under the Proposed Action and Alternative B during gather operations, due to vehicle traffic on predetermined routes and helicopter noise and disturbance associated with the gather. Effects of vehicle traffic and helicopter noise would be slight, however, as gather operations would seek to avoid sensitive wildlife species and areas, the size of the HMAs relative to the more limited areas affected by vehicle and helicopter noise and disturbance associated with the gather, and the short period of time vehicles and the helicopter will be disturbing these areas. Wild horse movements associated with the gather will temporarily displace some wildlife species but effects are expected to be slight due to the relative large size of the HMAs compared to wild horse movements associated with the gather, and the short period of time wild horses will be disturbing these areas.

Riparian and wetland sites within the Buckhorn and Coppersmith HMAs provide essential habitat and drinking water for many species of native wildlife. The Proposed Action and

Alternative B are designed to improve and protect streams (and associated riparian and wetland communities) by managing wild horses within established appropriate management levels necessary to maintain a thriving ecological balance. Enhanced conditions of these sites would include increased vigor and production of plants which provide forage and cover for wildlife throughout the year. The quality of drinking water for wildlife would be improved in spring sites, as a result of the reduction of sediment in the water, decreases in fecal coliform, and an increase in hiding cover.

The amount of biodiversity in a vegetation community is important in providing wildlife forage, browse, and cover that meet habitat requirements for a myriad of species. Upland communities that contain a mixture of perennial grasses, forbs, and shrubs supply quality habitat for many wildlife species, including mule deer and pronghorn. Many individual areas of the have experienced alteration of vegetation classes, primarily from past livestock grazing. Some areas have experienced a type conversion to non-native annual species or to native shrubs and short grasses. These areas provide an overall reduced quality of habitat for many wildlife species. Managing the number of wild horses to the established AML range will improve the biodiversity of plant communities over time and will provide an immediate increase in herbaceous plant production that would become available for wildlife forage and cover.

Effects on Greater Sage-Grouse Habitat: Greater sage-grouse and other ground nesting sagebrush obligate species such as sage sparrow and sage thrasher would be expected to benefit from increases in residual and new grass and forb cover as a result of decreased wild horse numbers. This would reduce the potential for heavy grazing and adverse impacts to sagebrush stands and native bunchgrasses. Direct impacts to nesting sage-grouse from the Proposed Action would be less than the current levels of impact, due to a reduction in wild horse numbers. Although direct impacts from both cattle and wild horses may occur, recent research from (Coates 2008) suggests that direct impacts contribute only a small amount to nest failure of sage-grouse. The Proposed Action would provide important indirect benefits by increasing the amount of residual grass nesting cover available for sage-grouse the following year due to a reduction in yearlong impacts from wild horses and a reduction in overall perennial grass consumption. Residual perennial grass cover would increase slightly throughout the Buckhorn and Coppersmith HMAs, providing increased nesting cover for ground nesting birds, specifically sage-grouse. Increases in residual grass cover would also benefit other sage-steppe obligate species such as sage sparrow and sage thrasher.

Riparian habitats, which are important for brood bearing and summer habitats are in a poor and nonfunctional condition in many areas of the HMAs. The reduction of wild horse numbers and yearlong wild horse impacts in riparian areas would provide important habitat improvements. These would result in increased hiding cover for fledged chicks, and increased foraging opportunities for both juvenile and adult sage-grouse. As riparian site conditions improve, increases in post-fledged chick survival would be expected to occur in the long term, due to more foraging opportunities and increased plant cover that would provide protection from aerial and ground predators.

The recent Federal Register publication pertaining to sage-grouse states "…a complex set of

environmental and biotic conditions that support the West Nile virus cycle must coincide for an outbreak to occur. Currently the annual patchy distribution of the disease is keeping the impacts at a minimum" (Federal Register 2010, at page 13970). Under the Proposed Action, 138 wild horses would be removed from the HMAs. However since wild horses are considered a "dead-end host", removing excess wild horses would have a negligible effect on the West Nile virus cycle and associated wildlife that can be infected by the virus.

Effects on Large Ungulates: Under the Proposed Action and Alternative B, residual grass cover, and to a lesser degree, shrub cover would increase and provide additional forage, hiding, and thermal cover for large ungulates over a larger area than is currently available within the Buckhorn and Coppersmith HMAs, due to less forage use by wild horses. Competition between mule deer, pronghorn antelope, and wild horses for limited forage and water resources would decrease in the short term due to fewer wild horses within the HMAs. In the long term, if wild horse numbers remain within the established AML, mule deer and pronghorn antelope would expand their range into recovering habitats, and into areas of marginal habitat, due to less competition with wild horses for the limited resources that exist in these areas. In the long term, the carrying capacity of pronghorn antelope and mule deer would be slightly increased within the HMAs due to more resources becoming available and increases in habitat quality and overall rangeland health.

There are established bitterbrush transects within the Buckhorn and Coppersmith HMAs and bitterbrush exists in each grazing allotment, mainly on the deeper soils. In most areas within the HMAs bitterbrush health has generally improved over the past decade, however during drought periods big game animals often forage heavily on bitterbrush, and bitterbrush health generally declines. Under the Proposed Action and Alternative B, bitterbrush production is expected to slightly improve in the long term due to less competition between wild horses and big game for succulent grasses and forbs compared to current levels, which would result in slightly less foraging on bitterbrush by big game. Increased bitterbrush health would provide for higher quality forage for deer and antelope, as well as cover and forage for small mammals and birds.

Effects on Golden Eagles: Under the Proposed Action and Alternative B, golden eagles might experience slightly reduced predatory success and increased search time in the short term due to more residual grass and hiding cover becoming available for prey species (kangaroo rats, jackrabbits, squirrels, etc.). In the short term, however, the effects of Alternative A or B on golden eagles are expected to be slight to negligible due to wild horses having few direct effects on golden eagles. In the long term, a reduction in wild horse population numbers would result in increased foraging opportunities and population growth of prey species (kangaroo rats, jackrabbits, squirrels, fawns, etc.) that would provide golden eagles with more prey opportunities and increased foraging success, possibility resulting in slightly increased fledgling survival.

Effects on Fish and Aquatic Species: Aquatic species are expected to benefit from the Proposed Action and Alternative B due to increases in riparian vegetation and residual grass height compared to current levels. Currently, many riparian sites and flowing streams are being impacted by excessive wild horse and livestock use and excessive erosion, which are

contributing to higher stream temperatures and increased sediment flows. Increased riparian vegetation and residual grass would contribute to lower water temperatures and decreased sediment transport. Overall fish health would be expected to improve, along with improvements in spawning habitats. In the short term, yearlong impacts from excessive wild horse grazing riparian areas would be reduced, and water quality would improve, benefiting numerous aquatic species. Fecal coliform and bacterial microorganisms within waterways would be reduced as a result of fewer wild horses excreting and defecating in the water. In the long term, improvements in overall fish health and reproduction would occur under the Proposed Action and Alternative B due to improvements in spawning habitat and from the narrowing of stream channels, which would create more hiding and foraging microhabitats.

Effects on Migratory Birds: Under the Proposed Action and Alternative B, migratory birds within the HMAs would benefit from immediate improvements in riparian vegetation. Due to less utilization from wild horses, riparian vegetation would recover more rapidly than current seasonal recovery. This would provide additional forage and nesting opportunities, as residual grass cover would improve. Under the Proposed Action and Alternative B wild horse numbers would be reduced, resulting in increases in riparian function and increased water storage, providing more habitat and foraging opportunities for resident and migratory birds.

Summary of Effects to Wildlife from Alternatives A and B: Overall, beneficial habitat changes would result from the implementation of the Proposed Action or Alternative B, primarily in the form of increased plant diversity and volume, which would benefit a myriad of wildlife species that typically exist in the sagebrush steppe ecosystem. Some species that are expected to benefit include greater sage-grouse, sage sparrow, and small mammals. Cover would be improved for young pronghorn antelope and mule deer. Golden eagles and other raptors would benefit from increases in prey populations responding to increases in cover and its effects on rodents, cottontails, and jack rabbits. Shrub cover is expected to remain within the range suitable for sage-grouse and other sage steppe obligate species. Wildlife benefits from improvements in riparian forage and hiding cover would increase in the short term due to more residual grass cover and increased riparian function. This would provide increased forage, as well as improvements in residual grass and nesting cover, reducing the potential for predation on sage-grouse and other ground or near ground nesting birds.

4.10.2 Effects of Alternatives C and D

Localized disturbance and temporary displacement of wildlife during the gather operations under Alternative C would be the same as for Alternatives A and B. There would be no localized disturbance or temporary displacement of wildlife from gather operations under Alternative D. Alternatives C and D would result in a continued increase in the numbers of wild horses above AML, which would have compounding impacts upon upland and riparian habitats. Since most upland sites within the HMAs are currently meeting standards for upland health, impacts will not likely become widespread throughout the HMAs until wild horse numbers increase to a point where the animals can no longer sustain themselves on the range. Impacts would be seen first in sites that are already close to crossing an ecological successional threshold, or on sites relatively close to water sources. The increased grazing

pressure from an overpopulation of wild horses in excess of the high AML would result in a decrease in native perennial species, and an increase in non-native (and invasive) annual species such as cheatgrass or shrubs tolerant of disturbance, such as rabbitbrush. This would reduce the diversity, quality and production of species that provide forage and cover for wildlife.

Implementation of Alternative C or D would result in further degradation of riparian/wetland sites in the Buckhorn and Coppersmith HMAs that are currently being documented as impacted by high utilization from wild horses. Riparian and wetland sites that are currently in proper functioning condition would also be at risk of degradation as wild horse numbers continue to increase. This degradation would cause a rapid decline in the amount and quality of riparian habitat for several wildlife species. Drinking water for wildlife would be of lower quality due to the high amount of sediment in the water from wild horse trampling, large numbers of wild horses defecating and urinating in water sources, and sites would have little to no hiding cover.

Effects on Greater Sage-Grouse Habitat: The implementation of Alternative C or D would result in adverse impacts to greater sage-grouse brood rearing habitat, as well as to summer habitat for a variety of other sage steppe mammals. Fewer areas of increased cover and forage would be available across the HMAs and important upland habitats for sage-grouse and other ground nesting birds would not improve. Adverse impacts would result from an increased population of wild horses and the associated intraspecific competition for forage (forbs and perennial grasses) and an increased potential of trampling of nests. Nest success for sage-grouse and other ground nesting birds would be adversely impacted due to excessive wild horse forage consumption, which would result in lowered residual grass heights and less vegetation structural diversity across the HMAs.

Sagebrush, meadow, and riparian communities are extremely important for sage-grouse, raptors, golden eagles, and large ungulates. The continued degradation of riparian/wetland sites within the HMAs could have a serious adverse impact to the quality of brood rearing and summer habitat for sage-grouse. The reduced height of perennial grasses from high levels of grazing utilization by wild horses and the reduced amount of plant cover could affect sage-grouse nest site selection and success; which could have adverse impacts to sage-grouse populations.

Effects on Large Ungulates: Competition for limited forage and water resources generally increases as population levels increase (Miller, 1981). Large ungulates including mule deer, and pronghorn antelope would not benefit from the implementation of either Alternative C or D due to increasingly high levels of interspecific competition for limited forage and water resources. Rangeland health would not improve and the use of recovering habitats by large ungulates would be limited, as additional habitat would not become available. During drought years and years of poor forage production, the body condition of all large ungulates (including wild horses) would decline, and reduced fecundity would occur the following year due to poor body condition and increased levels of competition. During drought years wild horses have been known to directly interfere and compete with other ungulates for access to water (Miller 1981, Miller 1983, Holechek *et al*., chapter 14). Wild horses and cattle have similar forage

requirements and a majority of wild horses forage requirements are met by perennial grasses (Miller 1983). As wild horse populations continued to rise under alternative C or D, less perennial grasses would remain across the landscape and these habitat changes would adversely affect a myriad of sage-steppe species.

Bitterbrush health would decline slightly when compared to current conditions, due to an increase in wild horse numbers. Increased wild horse grazing would have some effect on variability in diet selection of big game, which would focus foraging efforts from mule deer and pronghorn antelope on limited bitterbrush patches. The effect on bitterbrush plants would be more pronounced during drought periods when bitterbrush plants are stressed. During years of high snow, combined with the tall stature of some bitterbrush stands, foraging efforts from large ungulates would be concentrated on limited bitterbrush stands, resulting in increased hedging and reduced leader growth during those years.

Effects on Golden Eagles and Other Raptors: Golden eagles and other raptors would benefit in the short term from having more areas grazed by the larger population of wild horses under Alternatives C and D, which would make rodents and rabbits easier to catch. Over the long term, however, expected decreases in vegetation cover would adversely affect raptors by reducing the density and reproductive capability of prey species.

Effects on Fish and Aquatic Species: As the ecological health of riparian habitats declines (due to the heavy utilization and hoof action from wild horses), plant diversity and structural diversity of vegetation would be reduced. The functionality of riparian areas would deteriorate, resulting in increased sediment transport, reduced water storage capacity, and a decline in the condition of hydric soils. These changes would adversely affect both aquatic species and terrestrial species that are commonly found in sagebrush steppe environments. In the long term, overall fish health would be expected to decline, along with the degradation of spawning habitats. Fecal coliform and bacterial microorganisms within waterways would be increased due to an increased number of wild horses excreting and defecating in the water.

Effects on Migratory Birds: Under Alternative C or D migratory birds within the HMAs would be adversely impacted due to the declining condition of riparian vegetation and hiding cover. Alternative C or D would not reduce the number of wild horses in the HMAs, and yearlong impacts to riparian habitats would continue unabated. Foraging and nesting opportunities would slightly decrease within riparian areas as erosion, hoof action, and sediment transport would continue to threaten the function of many riparian habitats. Impacts to migratory birds would occur over a larger area and ground nesting migratory birds would be adversely impacted due to reductions in residual herbaceous cover and vegetation diversity.

Summary of Effects to Wildlife from Alternatives C and D:

Localized disturbance and temporary displacement of wildlife during the gather operations under Alternative C would be the same as for Alternatives A and B. There would be no localized disturbance or temporary displacement of wildlife from gather operations under Alternative D. Alternatives C and D would result in a continued increase in the numbers of wild horses above AML, which would have adverse impacts upon upland and riparian

habitats. Impacts would be seen first in sites that are close to crossing an ecological successional threshold or on sites relatively close to water sources. The increased grazing pressure from the overpopulation of wild horses in excess of the high AML would result in a decrease in native perennial species, and an increase in non-native (and invasive) annual species such as cheatgrass or shrubs tolerant of disturbance, such as rabbitbrush. This would reduce the diversity, quality and production of species across the landscape that provide important forage and cover for wildlife.

Residual grass cover, an important component for a variety of sage steppe species would continue to remain at lower levels than what would be achieved as a result of implementing the Proposed Action. Under Alternative C or D the direct competition for limited forage and water resources between wild horses, cattle, and big game would continue unabated. Less residual grass cover and lack of recovering habitats would limit foraging and reproductive opportunities for a number of ground nesting birds, including sage grouse, which could ultimately lower population levels. Under Alternative C or D improvements in rangeland health would not occur and improvements in habitat suitability that would benefit a variety of species including sage grouse, mule deer and pronghorn antelope would not occur due to fewer quality habitats and less habitat diversity across the landscape.

4.10.3 Cumulative Effects to Wildlife Habitat

The Proposed Action and Alternative B are not expected to degrade wildlife habitat from its current condition and improvements in habitat quality are expected to occur across the landscape. Other impacts to wildlife habitat that have occurred within the HMAs include historic livestock grazing, and wildfires. Livestock grazing within the HMAs is currently managed in compliance with land health standards and livestock grazing standards and guidelines, and grazing management systems have been implemented to meet rangeland health standards. In addition, livestock are managed following guidelines from the Conservation Strategy for Sage-Grouse (*Centrocercus urophasianus*) and Sagebrush Ecosystems within the Buffalo-Skedaddle Population Management Unit (Northeast California Sage-Grouse Working Group, 2003). *Conservation Strategy for Sage-Grouse (Centrocercus urophasianus) and Sagebrush Ecosystems within the Vya Population Management Unit* (Northeast California Sage-Grouse Working Group, 2006) and the *Conservation Strategy for Sage-Grouse (Centrocercus urophasianus) and Sagebrush Ecosystems within the Massacre Population Management Unit* (Northeast California Sage-Grouse Working Group, 2006).

Maintaining a balance of grazing animals and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to maintaining healthy upland and riparian plant communities that provide important wildlife forage and habitat. By managing wild horses as described in the Proposed Action and Alternative B, cumulative impacts to wildlife habitat are expected to be beneficial. Habitat enhancement projects, including the fencing of riparian and spring sites from livestock and wild horses, should, over time, further improve the habitat quality for sage-grouse and other wildlife.

Implementation of either Alternative C or D would result in degradation of riparian/wetland sites within the HMAs that are currently being impacted by high utilization by wild horses.

These impacts would cause a rapid decline in the amount and quality of riparian habitat for several wildlife species. Riparian and wetland sites that are functioning properly would also be at risk of degradation. Over time drinking water for wildlife would become nonexistent in some areas or be of very low quality due to the high amount of sediment and bacterial contamination in the water from wild horse trampling. Habitat for a myriad of sage steppe species, including but not limited to sage-grouse, mule deer, pronghorn antelope, and raptors could become degraded and less diverse, especially in riparian and wetland communities. The nesting success for ground nesting birds (including sage-grouse) could be adversely impacted as sites lose their native perennial species component and have reduced amounts of plant cover and litter that are typical of high quality nesting sites.

4.11 Effects on Wilderness Study Areas

4.11.1 Effects of Alternative A (Proposed Action) and Alternative B

The Proposed Action and Alternative B would result in direct, short-term impacts to wilderness values within one Wilderness Study Area (WSA), due to the sight and noise of the helicopter used to herd wild horses to gather sites. During the proposed gather, solitude and primitive recreation may be adversely impacted for recreationists who would be subjected to the sight and sound of the helicopter. This impact would only be temporary and of relatively short duration, as each capture site would be utilized for only 1 to 10 days, and only during daylight hours.

There are no trap sites or temporary holding areas located within the WSA, but there are two trap sites that are located just outside the Buffalo Hills WSA boundary. All approved trap sites are on, or next to, roads that provide access for trucks pulling stock trailers. During a gather, portable panels would be set up at each capture site for about 10 days. The capture sites are not expected to be used again for at least three years. The amount of surface disturbance, which would be limited to trampled vegetation and soils, would be one to five acres at each site. The gather operations would result in minor adverse impacts to wilderness characteristics in the form of trampled and crushed vegetation by vehicles and by animals as they approach the trap site. However, removing excess wild horses from the HMAs would result in long term benefits to wilderness characteristics, as this would reduce the damage to native plant communities and water sources from overgrazing and excessive trampling.

Implementation of the Proposed Action or Alternative B would result in the greatest period of time when wild horse numbers are within the established AML range. Consequently, the Proposed Action and Alternative B would be the most beneficial to wilderness values, and would not reduce the overall wilderness qualities of the WSA.

4.11.2 Effects of Alternatives C and D

The No Action Alternative and Alternative C would have the greatest adverse impacts on wilderness characteristics and values in the Buffalo Hills WSA, since excess wild horses would not be gathered and removed from the HMAs, and wild horse populations would continue to increase. Under Alternative C there would be short-term impacts to vegetation

and soils from the gather operations, as discussed above. Under Alternative D there would be no short term impacts from gather operations. However, both Alternatives C and D would result in impacts to soils, vegetation, and water sources from high utilization levels by excess numbers of wild horses which would affect the following wilderness values: 1) soil stability, 2) condition or trend of the vegetation, 3) natural biological diversity, 4) naturalness, and 5) quality of surface water. The amount of damage to plant communities from overgrazing and trampling that would result from the implementation of these alternatives have the potential to reduce the overall wilderness qualities within the WSA.

4.11.3 Cumulative Effects to Wilderness Study Areas

The Buckhorn and Coppersmith HMAs contains several areas where vegetation has been impacted by wildfires, historic livestock grazing, and other disturbances, which have altered the native plant communities. Maintaining a balance of grazing animals, and controlling the timing and amount of forage that is consumed each year by livestock and wild horses is crucial to preventing further damage to native plant communities, which comprise important wilderness characteristics, such as soil stability, condition of native vegetation, natural biological diversity, naturalness, and quality of surface water. By managing excess wild horses as described in the Proposed Action and Alternative B, native plant communities are expected to continue to meet land health standards and to improve in condition and biodiversity, and cumulative impacts are expected to be beneficial.

Implementation of Alternative C or D would leave the current over-population of wild horses and allow for further increases in wild horse numbers, and result in a high amount of disturbance to native vegetation and soils which would impact wilderness characteristics. Plant communities which have been impacted in the past by wildfires and historic livestock grazing would be very vulnerable to new invasions of invasive species, and to loss of biodiversity, due to the high amount of surface disturbance and trampling. Cumulative impacts would be a higher rate of spread of invasive weeds into new areas, and overall lowered condition of native plant communities.

5.0 LIST OF PREPARERS AND SPECIALISTS CONSULTED

Name	Resource/Activities	Project Role
Tim Burke	Field Manager	Project Lead
Sue Noggles	Planning and Environmental Coordinator	EA Preparer
John Parsons	Wild Horse and Burro Specialist	EA Input, Population Modeling
Steve Surian	Supervisory Rangeland Mgt. Specialist/ T&E/Sensitive plants	EA Input, Interdisciplinary Team
Steve Mathews	Rangeland Mgt. Specialist	EA Input, Interdisciplinary Team
Alexandra Urza	NEPA Coordinator/Wilderness	EA Input, Interdisciplinary Team
Jerry Bonham	Range Technician	EA Input, Interdisciplinary Team
Julie Rodman	Cultural Resources	EA Input, Interdisciplinary Team
Elias Flores	Wildlife Biologist/Riparian Specialist	EA Input, Interdisciplinary Team
Scott Soletti	Wildlife Biologist/Riparian Specialist/Noxious Weeds	EA Input, Interdisciplinary Team
Douglas Satica	Wild Horse and Burro Facilities Manager	EA Input
Amy Dumas	BLM California Wild Horse and Burro Specialist	EA Input

6.0 REFERENCES

1. Barber, M.R., Fayrer-Hosken, R.A. 2000. Evaluation of Somatic and Reproductive Immunotoxic Effects of the Porcine Zona Pellucida Vaccination. *Journal of Experimental Zoology*, Volume 286, Issue 6, pages 641–646.

2. Beever, Erik. Alan and Peter F. Brussard. 2000. Examining Ecological Consequences of Feral Horse Grazing Using Exclosures. *Western North American Naturalist* 60:236-254.

3. Beever, Erik. Alan and Peter F. Brussard. 2004. Community- and Landscape-Level Responses of Reptiles and Small Mammals to Feral-Horse Grazing in the Great Basin. *Journal of Arid Environments* 59:271-297.

4. Berger, Joel. 1986. *Wild Horses of the Great Basin: Social Competition and Population Size*. Univ. of Chicago Press. Chicago & London.

5. Blake, E. W. 1997. *Soil Survey of Washoe County, Nevada, Central Part*. U.S. Department of Agriculture, Natural Resources Conservation Service in cooperation with the U.S. Department of the Interior, Bureau of Land Management and Bureau of Indian Affairs, and the University of California Agricultural Experiment Station. Washington, D.C., Government Printing Office.

6. Carnie, K. 1954. Food habits of nesting golden eagles in the coast ranges of California. *Condor* 56(1): 3-12.

7. Coates, P. S., Connelly, J. W. and Delehanty, D. J. 2008. Predators of Greater Sage Grouse nests identified by video monitoring. *Journal of Field Ornithology*, 79: 421–428.

8. Connelly, John W., Schroeder, Michael A., Sands, Alan R., and Braun, Clait E. Guidelines to Manage Sage Grouse Populations and Their Habitats. *Wildlife Society Bulletin* Vol. 28, No. 4 (Winter, 2000), pp. 967-985.

9. Evans, J. Warren, Bortan, A., Hinz H., Van Vlock, L. 1970. The Horse. Page 357.

10. Federal Register. 2010. Vol. 75 No. 55. March 23, 2010. Page 13970.

11. Fleischner, T. L. (1994), Ecological Costs of Livestock Grazing in Western North America. Conservation Biology, 8: 629–644.

12. Ganskopp, D.C. and M. Vavra. 1986. Habitat Use by Feral Horses in the Northern Sagebrush Steppe. *Journal of Range Management* 39(3):207-211.

13. Ganskopp, D.C. and M. Vavra. 1987. Slope Use by Cattle, Feral Horses, Deer, and Bighorn Sheep. *Northwest Science*, 61(2):74-80.

14. Garrott, R.A., Taylor, L. 1990. Dynamics of a Feral Horse Population in Montana. *Journal of Wildlife Management*, 54 (4): 603-612.

15. Garrott, R.A., Taylor, L. 1991. Growth rates of Feral Horse Populations. *Journal of Wildlife Management*, 55 (4): 641-648.

16. Gregg, M., M. Bray, K. Kilbride, and M. Dunbar. 2001. Birth synchrony and survival of pronghorn fawns. *Journal of Wildlife Management* 65(1): 19-24.

17. Heleski, C., Greene, B., Ralston, S., Stull, C. 2010. *Independent Designated Observer Pilot Program Final Report.* American Horse Protection Association Report to BLM. October, 2010.

18. Henneke, D. R. 1983. Relationship Between Condition Score, Physical Measurements and Body Fat Percentage in Mares. *Equine Veterinary Journal*. 15(4), 371-372

19. Holechek, J.L., Pieper, R.D., Herbel, C.H. *Range Management: Principles and Practices*. Pearson Education, Inc. Fifth Edition. Chapter 14 pp. 475-48.

20. Isavaran, Kavita. 2005. Variation in male mating behavior within ungulate populations: patterns and processes. *Current Science*, 89(7): 1192-1199.

21. Jenkins, S.H. 1989. Comments on an Inappropriate Population Model for Feral Burros. *Journal of Mammalogy*, Vol. 70, No. 3 (Aug, 1989), pp. 667-670.

22. Kelm, O.S., Atwill, R.E., Rubin, E.S. Jorgensen, C.M. Boyce, W.M. 2008. Interactions between Feral Horses and Desert Bighorn Sheep at Water. *Journal of Mammalogy*, 89(2):459-466.

23. Kirkpatrick, Jay F. and Fazio, Patricia M. 2009. *Immunocontraceptive Reproductive Control Utilizing Porcine Zona Pellucida (PZP)in Federal Wild Horse Populations* (Second Edition). http://www.zoomontana.org/conservation_center/pzp_q_and_a.pdf .

24. Kirkpatrick, J., 1995, Management of Wild Horses by Fertility Control: The Assateague Experience: Scientific Monograph NPS/NRASIS/NRSM-96/26, U.S. Department of Interior, National Park Service, 60 p.

25. Knick, S. T., and J. W. Connelly (editors). 2011. Greater Sage-Grouse: Ecology and conservation of a landscape species and its habitats. Studies in Avian Biology Series (vol. 38), University of California Press, Berkeley, CA.

26. Larrucea, Eveline; 2006; Bureau of Land Management Surprise Field Office Pygmy Rabbit (*Brachylagus idahoensis*) Survey.

27. Larrucea, E. S., & Brussard, P. F. (2008). Habitat Selection and Current Distribution of the Pygmy Rabbit in Nevada and California, USA. *Journal of Mammalogy, 89(3),* 691-699.

28. Loe, Leif Egil, Atle Mysterud, Vebjorn Veiberg & Rof Langvatn. 2009. Negative density dependent emigration of males in an increasing red deer population. Proc. R. Soc. B (2009) 276, 2581-2587.

29. McInnis, M.A. and M. Vavra. 1987. Dietary relationships among feral horses, cattle, and pronghorn in southeastern Oregon. *Journal of Range Mgt.* 40(1):60-66.

30. Miller. R. 1981. Male Aggression, Dominance and Breeding Behavior in Red Desert Feral Horses. *Z. Tierpsychol.* 57: 340-351 from Holechek et al. Range Management: Principles and Practices.

31. Miller, R. 1983. Habitat Use of Feral Horses and Cattle in Wyoming's Red Desert. *Journal of Range Management*, Vol. 36, No. 2 pp. 195-199.

32. Miller, R. F., and L. L. Eddleman. 2001. Spatial and temporal changes of sage-grouse habitat in the sagebrush biome. Agricultural Experiment Station Technical Bulletin 151. Oregon State University, Corvallis, USA.

33. Nevada Department of Wildlife. 2009-2010. Big Game Status, available at http://www.ndow.org/about/pubs/index.shtm#general

34. Northeast California Sage-grouse Working Group. 2006. Conservation Strategy for Sage-Grouse (*Centrocercus urophansianus*) and Sagebrush Ecosystems within the Massacre and Vya Populations Management Unit.

35. O'Gara, B. 1978. Antilocapra americana. *Mammalian Species*. Number 90: 1-7.

36. Pellant, Mike, David.A. Pyke, Patrick. Shaver, and Jeffrey E. Herrick. 2000. *Interpreting Indicators of Rangeland Health Version 3.* BLM Technical. Reference. 1734-6. Denver: U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center.

37. Pyshora, L. 1977. The pronghorn antelope in northeastern California. Department of Fish and Game Wildlife Management Administrative Report, Number 77-2. 46 pages.

38. Reynolds, T. D. 1984. Daily summer movements, activity patterns, and home range of pronghorn. *Northwest Sci*. 58:300-311.

39. Sager, Stephanie. 1992. A population ecology study of feral horses on Hog Ranch Bare Allotment, Washoe County, Nevada. MS thesis, California State University, Sacramento.

40. Séquin, Eveline. 2004. Bureau of Land Management Surprise Field Office Pygmy Rabbit (*Brachylagus idahoensis*) Survey: May-September 2004. Reno, NV: University of Nevada, Reno, Program in Ecology, Evolution, and Conservation Biology.

41. Singer, F.J., Osborne, R. 2000. *Development and Assessment of Tools That Managers Could use to Monitor Wild Horse Populations*. Resource Notes No. 32. Resource Ecology Lab Colorado State University.

42. Slusser, Steve 1999. Soil Survey of Washoe County, Nevada, North Part. USDA Natural Resources Conservation Service in cooperation with the Bureau of Land Management and the University of Nevada Agriculture Experiment Station. U.S. Government Printing Office.

Washington, D.C.

43. Summerfield, JR., and D. G. Bagely 1974. Soil Survey of Surprise Valley-Home Camp Area, California-Nevada. USDA Natural Resources Conservation Service and Forest Service, in cooperation with the University of California and University of Nevada Agricultural Experiment Station and USDI Bureau of Land Management. U.S. Government Printing Office. Washington, D.C.

44. Turner Jr., J.W., I.K.M. Lui, Rutberg, A., J.W., Kirkpatrick. 1997. Immuno-contraception Limits Foal Production in Free Roaming Feral Horses in Nevada, *J. Wildl. Manage*. 61 (3):873-880.

45. Tri-State Operational Working Group, 2010. Bureau of Land Management and U.S. Fish and Wildlife Service. Memorandum of Understanding No. NV-91010-001.

46. U.S. Code, Wild Free Roaming Horse and Burro Act of 1971, 43 U.S.C 1331–1340, 43 CFR 4700.

47. United States Department of the Interior, Interior Board of Land Appeals. 2010. IBLA 2009-246. MT-COI0-2009-0001.

48. U.S. Department of the Interior, Bureau of Land Management. 2012. Instruction Memorandum No. 2012-045: New Program Measures for Wild Horse and Burro Program.

49. U.S. Department of the Interior, Bureau of Land Management. 2011. A Report on National Greater Sage-grouse Conservation Measures. December 2011, page 18.

50. U.S. Department of the Interior, Bureau of Land Management. 2011. Instruction Memorandum No. 2012-043: Greater Sage-grouse Interim Management Policies and Procedures.

51. U.S. Department of the Interior, Bureau of Land Management. 2011. Instruction Memorandum No. 2011-193: FY 2012 "Director's Challenge": Expanding Volunteer Engagement in Monitoring and Sustaining the Health of BLM Wild Horse and Burro Herd Management Areas.

52. U.S. Department of the Interior, Bureau of Land Management. 2011. Instruction Memorandum No. 2011-040: Protocols for Media at Wild Horse and Burro Gathers.

53. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-057: Wild Horse and Burro Population Inventory and Estimation.

54. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-130, Change 1. Wild Horse and Burro Gather Decisions.

55. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-135. Gather Policy, Selective Removal Criteria, and Management Considerations for Reducing Population Growth Rates.

56. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-162: Wild Horse and Burro Gather Daily Reporting Policy, Internal Communications Protocols.

57. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-164: Public Observation of Wild Horse and Burro Gathers.

58. U.S. Department of the Interior, Bureau of Land Management. 2010. Instruction Memorandum No. 2010-183: Helicopter Capture of Wild Horses and Burros.

59. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-041: Change 1 to Washington Office Instruction Memorandum No. 2009-041- Euthanasia of Wild Horses and Burros for Reasons Related to Health, Handling and Acts of Mercy.

60. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-062: Wild Horse and Burro Genetic Baseline Sampling.

61. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-063: Gelding of Wild Horses and Burros and Gelding Vouchers.

62. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-074: Wild Horse and Burro Vaccinations in Short-term Holding Facilities.

63. U.S. Department of the Interior, Bureau of Land Management. 2009. Instruction Memorandum No. 2009-090: Population-Level Fertility Control Field Trials: Herd Management Area (HMA) Selection, Vaccine Application, Monitoring and Reporting Requirements.

64. U.S. Department of the Interior, Bureau of Land Management. 2009. Wild Horse and Burro Aviation Management Handbook.

65. U.S. Department of the Interior, Bureau of Land Management. 2008-2009. Surprise Field Office Carson Wandering Skipper Surveys.

66. United States Department of the Interior, Bureau of Land Management. 2007. BLM Instruction Memorandum No. 2008-050. Migratory Bird Treaty Act- Interim Management Guidance.

67. U.S. Department of the Interior, Bureau of Land Management. 2002. BLM Instruction Memorandum No. 2010-135: Gather Policy, Selective Removal Criteria and Management Considerations for Reducing Populations Growth Rates (WH&B).

68. U.S. Department of the Interior, Bureau of Land Management. 1999. A user guide to assessing proper functioning condition and the supporting science for lentic areas. Tech. Ref. 1737-16. Natl. Applied Resource Sci. Center. Denver, CO.

69. U.S. Department of the Interior, Bureau of Land Management. 1998. A user guide to assessing proper functioning condition and the supporting science for lotic areas. Tech. Ref. 1737-15. Natl. Applied Resource Sci. Center. Denver, CO.

70. U.S. Department of the Interior, Bureau of Land Management. 1998a. *Rangeland Health Standards and Guidelines for California and Northwestern Nevada Final Environmental Impact Statement*. Sacramento, CA: BLM California State Office.

71. U.S. Department of the Interior, Bureau of Land Management. 1995. The Interim Management Policy for Lands under Wilderness Review, BLM H-8550-1, Chapter IIIE, Wild Horse and Burro Management.

72. U.S. Department of the Interior, Bureau of Land Management. 1979. Tuledad/Home Camp Management Framework Plan.

73. U.S. Department of the Interior, Bureau of Land Management. Manual 6840 Special Status Species Management.

74. United States Government Accountability Office, October 2008, GAO-09-77, Effective Long-Term Options Needed to Manage Unadoptable Wild Horses.

75. Yoakum, J.D. 2004. Habitat Characteristics and Requirements. Pages 409-445 *in* B.W. O'Gara, J.D. Yoakum, and R. E. McCabe, editors. Pronghorn ecology and management. A Wildlife Management Institute Book, University Press of Colorado, Boulder, Colorado.

76. Zoo Montana. 2000. Porcine Zona Pellucida Vaccine. http://www.zoomontana.org/science-and-conservation-center/application-of-pzp-to-wildlife/

APPENDIX A. Standard Operating Procedures for Wild Horse Gathers

Gathers are conducted by utilizing contractors from the Wild Horse Gathers-Western States Contract or BLM personnel. The following procedures for gathering and handling wild horses apply whether a contractor or BLM personnel conduct a gather. For helicopter gathers conducted by BLM personnel, gather operations will be conducted in conformance with the *Wild Horse Aviation Management Handbook* (January 2009).

Prior to any gathering operation, the BLM will provide for a pre-capture evaluation of existing conditions in the gather area(s). The evaluation will include animal conditions, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with wilderness boundaries, the location of fences, other physical barriers, and acceptable trap locations in relation to animal distribution. The evaluation will determine whether the proposed activities will necessitate the presence of a veterinarian during operations. If it is determined that a large number of animals may need to be euthanized or capture operations could be facilitated by a veterinarian, these services would be arranged before the capture would proceed. The contractor will be apprised of all conditions and will be given instructions regarding the capture and handling of animals to ensure their health and welfare is protected.

Trap sites and temporary holding sites will be located to reduce the likelihood of injury and stress to the animals, and to minimize potential damage to the natural resources of the area. These sites would be located on or near existing roads whenever possible.

The primary capture methods used in the performance of gather operations include:

1. Helicopter Drive Trapping. This capture method involves utilizing a helicopter to herd wild horses into a temporary trap.
2. Helicopter Assisted Roping. This capture method involves utilizing a helicopter to herd wild horses to ropers.
3. Bait or Water Trapping. This capture method involves utilizing bait (e.g., water or feed) to lure wild horses into a temporary trap.

The following procedures and stipulations will be followed to ensure the welfare, safety and humane treatment of wild horses in accordance with the provisions of 43 CFR 4700.

A. Capture Methods used in the Performance of Gather Contract Operations

1. The primary concern of the contractor is the safe and humane handling of all animals captured. All capture attempts shall incorporate the following:
    a. All trap and holding facilities locations must be approved by the Contracting Officer's Representative (COR) and/or the Project Inspector (PI) prior to construction. The Contractor may also be required to change or move trap locations as determined by the COR/PI. All traps and holding facilities not

located on public land must have prior written approval of the landowner.

2. The rate of movement and distance the animals travel shall not exceed limitations set by the COR/PI who will consider terrain, physical barriers, weather, condition of the animals and other factors. Under normal circumstances this travel should not exceed 10 miles and may be much less dependent on existing conditions (i.e. ground conditions, animal health, extreme temperatures (high and low)).
3. All traps, wings, and holding facilities shall be constructed, maintained and operated to handle the animals in a safe and humane manner and be in accordance with the following:
    a. Traps and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches high for horses, and the bottom rail of which shall not be more than 12 inches from ground level. All traps and holding facilities shall be oval or round in design.
    b. All loading chute sides shall be a minimum of 6 feet high and shall be fully covered, plywood, metal without holes larger than 2"x4".
    c. All runways shall be a minimum of 30 feet long and a minimum of 6 feet high for horses, and shall be covered with plywood, burlap, plastic snow fence or like material a minimum of 1 foot to 6 feet for horses. The location of the government furnished portable fly chute to restrain, age, or provide additional care for the animals shall be placed in the runway in a manner as instructed by or in concurrence with the COR/PI.
    d. All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, plastic snow fence, etc.) and shall be covered a minimum of 2 feet to 6 feet for horses
    e. All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking or sliding gates.
4. No modification of existing fences will be made without authorization from the COR/PI. The Contractor shall be responsible for restoration of any fence modification which he has made.
5. When dust conditions occur within or adjacent to the trap or holding facility, the Contractor shall be required to wet down the ground with water.
6. Alternate pens, within the holding facility shall be furnished by the Contractor to separate mares or jennies with small foals, sick and injured animals, strays or other animals the COR determines need to be housed in a separate pen from the other animals. Animals shall be sorted as to age, number, size, temperament, sex, and condition when in the holding facility so as to minimize, to the extent possible, injury due to fighting and trampling. Under normal conditions, the government will require that animals be restrained for the purpose of determining an animal's age, sex, or other necessary procedures. In these instances, a portable restraining chute may be necessary and will be provided by the government. Alternate pens shall be furnished by the Contractor to hold animals if the specific gathering requires that animals be released back into the capture

area(s). In areas requiring one or more satellite traps, and where a centralized holding facility is utilized, the contractor may be required to provide additional holding pens to segregate animals transported from remote locations so they may be returned to their traditional ranges. Either segregation or temporary marking and later segregation will be at the discretion of the COR.

7. The Contractor shall provide animals held in the traps and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the traps or holding facilities shall be provided good quality hay at the rate of not less than two pounds of hay per 100 pounds of estimated body weight per day. The contractor will supply certified weed free hay if required by State, County, and Federal regulation.

   An animal that is held at a temporary holding facility through the night is defined as a horse feed day. An animal that is held for only a portion of a day and is shipped or released does not constitute a feed day.

8. It is the responsibility of the Contractor to provide security to prevent loss, injury or death of captured animals until delivery to final destination.

9. The Contractor shall restrain sick or injured animals if treatment is necessary. The COR/PI will determine if animals must be euthanized and provide for the destruction of such animals. The Contractor may be required to humanely euthanize animals in the field and to dispose of the carcasses as directed by the COR/PI.

10. Animals shall be transported to their final destination from temporary holding facilities as quickly as possible after capture unless prior approval is granted by the COR for unusual circumstances. Animals to be released back into the HMA following gather operations may be held up to 21 days or as directed by the COR. Animals shall not be held in traps and/or temporary holding facilities on days when there is no work being conducted except as specified by the COR. The Contractor shall schedule shipments of animals to arrive at final destination between 7:00 a.m. and 4:00 p.m. No shipments shall be scheduled to arrive at final destination on Sunday and Federal holidays, unless prior approval has been obtained by the COR. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three (3) hours in any 24 hour period. Animals that are to be released back into the capture area may need to be transported back to the original trap site. This determination will be at the discretion of the COR/PI or Field Office horse specialist.

B. Capture Methods That May Be Used in the Performance of a Gather

1. Capture attempts may be accomplished by utilizing bait (feed, water, mineral licks) to lure animals into a temporary trap. If this capture method is selected, the following applies:

   a. Finger gates shall not be constructed of materials such as "T" posts, sharpened willows, etc., that may be injurious to animals.

b. All trigger and/or trip gate devices must be approved by the COR/PI prior to capture of animals.

c. Traps shall be checked a minimum of once every 10 hours.

2. Capture attempts may be accomplished by utilizing a helicopter to drive animals into a temporary trap. If the contractor selects this method the following applies:

   a. A minimum of two saddle-horses shall be immediately available at the trap site to accomplish roping if necessary. Roping shall be done as determined by the COR/PI. Under no circumstances shall animals be tied down for more than one half hour.

   b. The contractor shall assure that foals shall not be left behind, and orphaned.

3. Capture attempts may be accomplished by utilizing a helicopter to drive animals to ropers. If the contractor, with the approval of the COR/PI, selects this method the following applies:

   a. Under no circumstances shall animals be tied down for more than one hour.

   b. The contractor shall assure that foals shall not be left behind, or orphaned.

   c. The rate of movement and distance the animals travel shall not exceed limitations set by the COR/PI who will consider terrain, physical barriers, weather, condition of the animals and other factors.

C. Use of Motorized Equipment

1. All motorized equipment employed in the transportation of captured animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals. The Contractor shall provide the COR/PI, if requested, with a current safety inspection (less than one year old) for all motorized equipment and tractor-trailers used to transport animals to final destination.
2. All motorized equipment, tractor-trailers, and stock trailers shall be in good repair, of adequate rated capacity, and operated so as to ensure that captured animals are transported without undue risk or injury.
3. Only tractor-trailers or stock trailers with a covered top shall be allowed for transporting animals from trap site(s) to temporary holding facilities, and from temporary holding facilities to final destination(s). Sides or stock racks of all trailers used for transporting animals shall be a minimum height of 6 feet 6 inches from the floor. Single deck tractor-trailers 40 feet or longer shall have at least two (2) partition gates providing at least three (3) compartments within the trailer to separate animals. Tractor-trailers less than 40 feet shall have at least one partition gate providing at least two (2) compartments within the trailer to separate the animals. Compartments in all tractor-trailers shall be of equal size plus or minus 10 percent. Each partition shall be a minimum of 6 feet high and shall have a minimum 5 foot wide swinging gate. The use of double deck tractor-trailers is unacceptable and shall not be allowed.

4. All tractor-trailers used to transport animals to final destination(s) shall be equipped with at least one (1) door at the rear end of the trailer which is capable of sliding either horizontally or vertically. The rear door(s) of tractor-trailers and stock trailers must be capable of opening the full width of the trailer. Panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of all trailers must be strong enough so that the animals cannot push their hooves through the side. Final approval of tractor-trailers and stock trailers used to transport animals shall be held by the COR/PI.
5. Floors of tractor-trailers, stock trailers and loading chutes shall be covered and maintained with wood shavings to prevent the animals from slipping as much as possible during transport.
6. Animals to be loaded and transported in any trailer shall be as directed by the COR/PI and may include limitations on numbers according to age, size, sex, temperament and animal condition. The following minimum square feet per animal shall be allowed in all trailers:

   11 square feet per adult horse (1.4 linear foot in an 8 foot wide trailer);

   6 square feet per horse foal (.75 linear foot in an 8 foot wide trailer);

   The COR/PI shall consider the condition and size of the animals, weather conditions, distance to be transported, or other factors when planning for the movement of captured animals. The COR/PI shall provide for any marking and/or inspection services required for the captured animals.
7. If the COR/PI determines that dust conditions are such that the animals could be endangered during transportation, the Contractor will be instructed to adjust speed.

D. Safety and Communications

1. The Contractor shall have the means to communicate with the COR/PI and all contractor personnel engaged in the capture of wild horses utilizing a VHF/FM Transceiver or VHF/FM portable Two-Way radio. If communications are ineffective the government will take steps necessary to protect the welfare of the animals.
   a. The proper operation, service and maintenance of all contractor furnished property is the responsibility of the Contractor. The BLM reserves the right to remove from service any contractor personnel or contractor furnished equipment which, in the opinion of the contracting officer or COR/PI violate contract rules, are unsafe or otherwise unsatisfactory. In this event, the Contractor will be notified in writing to furnish replacement personnel or equipment within 48 hours of notification. All such replacements must be approved in advance of operation by the Contracting Officer or his/her representative.
   b. The Contractor shall obtain the necessary FCC licenses for the radio system
   c. All accidents occurring during the performance of any task order shall be immediately reported to the COR/PI.

2. Should the contractor choose to utilize a helicopter the following will apply:
    a. The Contractor must operate in compliance with Federal Aviation Regulations, Part 91. Pilots provided by the Contractor shall comply with the Contractor's Federal Aviation Certificates, applicable regulations of the State in which the gather is located.
    b. Fueling operations shall not take place within 1,000 feet of animals.

G. Site Clearances

No personnel working at gather sites may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage or otherwise alter or deface any archaeological resource located on public lands or Indian lands.

Prior to setting up a trap or temporary holding facility, BLM will conduct all necessary clearances (archaeological, T&E, etc.). All proposed site(s) must be inspected by a government archaeologist. Once archaeological clearance has been obtained, the trap or temporary holding facility may be set up. Said clearance shall be arranged for by the COR, PI, or other BLM employees.

Gather sites and temporary holding facilities would not be constructed on wetlands or riparian zones.

H. Animal Characteristics and Behavior

Releases of wild horses would be near available water. If the area is new to them, a short-term adjustment period may be required while the wild horses become familiar with the new area.

I. Public Participation

Opportunities for public viewing (i.e. media, interested public) of gather operations will be made available to the extent possible; however, the primary considerations will be to protect the health, safety and welfare of the animals being gathered and the personnel involved. The public must adhere to guidance from the on-site BLM representative. It is BLM policy that the public will not be allowed to come into direct contact with wild horses being held in BLM facilities. Only authorized BLM personnel or contractors may enter the corrals or directly handle the animals. The general public may not enter the corrals or directly handle the animals at any time or for any reason during BLM operations.

J. Responsibility and Lines of Communication

The Contracting Officer's Representatives (CORs) and the project inspectors (PIs) have the direct responsibility to ensure the Contractor's compliance with the contract stipulations. The Assistant Field Managers for Resources and Field Managers will take an active role to ensure the appropriate lines of communication are established between the field, Field Office, State Office, National Program Office, and BLM Holding Facility offices. All employees involved in the gathering operations will keep the best interests of the animals at the forefront at all times.

All publicity, formal public contact and inquiries will be handled through the Assistant Field Managers for Renewable Resources and Field Office Public Affairs. These individuals will be the primary contact and will coordinate with the COR/PI on any inquiries.
The COR will coordinate with the contractor and the BLM Corrals to ensure animals are being transported from the capture site in a safe and humane manner and are arriving in good condition.

The contract specifications require humane treatment and care of the animals during removal operations. These specifications are designed to minimize the risk of injury and death during and after capture of the animals. The specifications will be vigorously enforced.

Should the Contractor show negligence and/or not perform according to contract stipulations, he will be issued written instructions, stop work orders, or defaulted.

APPENDIX B. Standard Operating Procedures for Wild Horse Population-level Fertility Control Treatments

One-year Liquid Vaccine: The following implementation and monitoring requirements are part of the Proposed Action:

1. PZP vaccine would be administered through darting by trained BLM personnel or collaborating research partners only. For any darting operation, the designated personnel must have successfully completed a Nationally recognized wildlife darting course and who have documented and successful experience darting wildlife under field conditions.
2. Mares that have never been treated would receive 0.5 cc of PZP vaccine emulsified with 0.5 cc of Freund's Modified Adjuvant (FMA) and loaded into darts at the time a decision has been made to dart a specific mare. Mares identified for re-treatment receive 0.5 cc of the PZP vaccine emulsified with 0.5 cc of Freund's Incomplete Adjuvant (FIA).
3. The liquid dose of PZP vaccine is administered using 1.0 cc Pneu-Darts with 1.5" barbless needles fired from either Dan Inject® or Pneu-Dart® capture gun.
4. Only designated darters would mix the vaccine/adjuvant and prepare the emulsion. Vaccine-adjuvant emulsion would be loaded into darts at the darting site and delivered by means of a capture gun.
5. Delivery of the vaccine would be by intramuscular injection into the left or right hip/gluteal muscles while the mare is standing still.
6. Safety for both humans and the horse is the foremost consideration in deciding to dart a mare. The Dan Inject® gun would not be used at ranges in excess of 30 m while the Pneu-Dart® capture gun would not be used over 50 m, and no attempt would be taken when other persons are within a 30-m radius of the target animal.
7. No attempts would be taken in high wind or when the horse is standing at an angle where the dart could miss the hip/gluteal region and hit the rib cage. The ideal is when the dart would strike the skin of the horse at a perfect 90° angle.
8. If a loaded dart is not used within two hours of the time of loading, the contents would be transferred to a new dart before attempting another horse. If the dart is not used before the end of the day, it would be stored under refrigeration and the contents transferred to another dart the next day. Refrigerated darts would not be used in the field.
9. No more than two people should be present at the time of a darting. The second person is responsible for locating fired darts. The second person should also be responsible for identifying the horse and keeping onlookers at a safe distance.
10. To the extent possible, all darting would be carried out in a discrete manner. However, if darting is to be done within view of non-participants or members of the public, an explanation of the nature of the project would be carried out either immediately before or after the darting.
11. Attempts will be made to recover all darts. To the extent possible, all darts which are discharged and drop from the horse at the darting site would be recovered before another darting occurs. In exceptional situations, the site of a lost dart may be noted and marked,

and recovery efforts made at a later time. All discharged darts would be examined after recovery in order to determine if the charge fired and the plunger fully expelled the vaccine.

12. All mares targeted for treatment will be clearly identifiable through photographs to enable researchers and HMA managers to positively identify the animals during the research project and at the time of removal during subsequent gathers.
13. Personnel conducting darting operations should be equipped with a two-way radio or cell phone to provide a communications link with the Project Veterinarian for advice and/or assistance. In the event of a veterinary emergency, darting personnel would immediately contact the Project Veterinarian, providing all available information concerning the nature and location of the incident.
14. In the event that a dart strikes a bone or imbeds in soft tissue and does not dislodge, the darter would follow the affected horse until the dart falls out or the horse can no longer be found. The darter would be responsible for daily observation of the horse until the situation is resolved.

22-month Time-release Pelleted Vaccine: The following implementation and monitoring requirements are part of the Proposed Action:

1. PZP vaccine would be administered only by trained BLM personnel or collaborating research partners.
2. The fertility control drug is administered with two separate injections: (1) a liquid dose of PZP is administered using an 18-gauge needle primarily by hand injection; (2) the pellets are preloaded into a 14-gauge needle. These are delivered using a modified syringe and jabstick to inject the pellets into the gluteal muscles of the mares being returned to the range. The pellets are designed to release PZP over time similar to a time-release cold capsule.
3. Delivery of the vaccine would be by intramuscular injection into the gluteal muscles while the mare is restrained in a working chute. The primer would consist of 0.5 cc of liquid PZP emulsified with 0.5 cc of Freunds Modified Adjuvant (FMA). The pellets would be loaded into the jabstick for the second injection. With each injection, the liquid or pellets would be injected into the left hind quarters of the mare, above the imaginary line that connects the point of the hip (hook bone) and the point of the buttocks (pin bone).
4. In the future, the vaccine may be administered remotely using an approved long range darting protocol and delivery system if or when that technology is developed.
5. All treated mares will be freeze-marked on the hip or neck HMA managers to positively identify the animals during the research project and at the time of removal during subsequent gathers.

Monitoring and Tracking of Treatments:

1. At a minimum, estimation of population growth rates using helicopter or fixed-wing surveys will be conducted before any subsequent gather. During these surveys it is not

necessary to identify which foals were born to which mares; only an estimate of population growth is needed (i.e. # of foals to # of adults).

2. Population growth rates of herds selected for intensive monitoring will be estimated every year post-treatment using helicopter or fixed-wing surveys. During these surveys it is not necessary to identify which foals were born to which mares, only an estimate of population growth is needed (i.e. # of foals to # of adults). If, during routine HMA field monitoring (on-the-ground), data describing mare to foal ratios can be collected, these data should also be shared with the NPO for possible analysis by the USGS.
3. A PZP Application Data sheet will be used by field applicators to record all pertinent data relating to identification of the mare (including photographs if mares are not freeze-marked) and date of treatment. Each applicator will submit a PZP Application Report and accompanying narrative and data sheets will be forwarded to the NPO (Reno, Nevada). A copy of the form and data sheets and any photos taken will be maintained at the field office.
4. A tracking system will be maintained by NPO detailing the quantity of PZP issued, the quantity used, disposition of any unused PZP, the number of treated mares by HMA, field office, and State along with the freeze-mark(s) applied by HMA and date.

APPENDIX C. Summary of Population Modeling of Wild Horses for the Buckhorn and Coppersmith HMAs

Population Model Overview

WinEquus is a computer software program designed to simulate population dynamics based on various management alternatives concerning wild horses. It was developed by Stephen H. Jenkins of the Department of Biology, University of Nevada at Reno. For further information about the model, please contact Stephen H. Jenkins at the Department of Biology/314, University of Nevada, Reno, NV 89557.

The following data was summarized from the information provided within the WinEquus program. It will provide background about the use of the model, the management options that may be used, interpretation of modeling results, and the types of output that may be generated.

The population model for wild horses was designed to help wild horse and burro specialists evaluate various management strategies that might be considered for a particular area. The model uses data on average survival probabilities and foaling rates of horses to project population growth for up to 20 years. The model accounts for year-to-year variation in these demographic parameters by using a randomization process to select survival probabilities and foaling rates for each age class from a distribution of values based on these averages. This aspect of population dynamics is called environmental stochasticity, and reflects the fact that future environmental conditions that may affect a wild horse population's demographics cannot be established in advance. Therefore, each trial will give a different pattern of population growth. Some trials may include mostly "good" years, when the population grows rapidly; other trials may include a series of several "bad" years in succession. The stochastic approach to population modeling uses repeated trials to project a range of possible population trajectories over a period of years, which is more realistic than predicting a single specific trajectory.

The model incorporates both selective removal and fertility treatment as management strategies. A simulation may include no management, selective removal, fertility treatment, or both removal and fertility treatment. Wild horse and burro specialists can specify many different options for these management strategies such as the schedule of gathers for removal or fertility treatment, the threshold population size which triggers a gather, the target population size following a removal, the ages and sexes of horses to be removed, and the effectiveness of fertility treatment.

To run the program, one must supply an initial age distribution (or have the program calculate one), annual survival probabilities for each age-sex class of horses, foaling rates for each age class of females, and the sex ratio at birth. Sample data are available for all of these parameters. Basic management options must also be specified.

Population Data: Age-Sex Distribution

An important point about the initial age-sex distribution is that it is NOT necessarily the starting population for each of the trials in a simulation. This is because the program assumes that the initial age-sex distribution supplied on this form or calculated from a population size that the user enters is not an exact and complete count of the population. For example, if the user enters an initial population size of 100 based on an aerial survey, this is really an estimate of the population and not a census. Furthermore, it is likely to be an underestimate because some horses will be missed in the survey. Therefore, the program uses an average sighting probability of approximately 90% (Garrott *et al*. 1991) to "scale-up" the initial population estimate to a starting population size for use in each trial. This is done by a random process, so the starting population sizes are different for all trials. An option does exist to consider the initial population size to be exact and bypass this scaling-up process.

Population Data: Survival Probabilities

A fundamental requirement for a population model is data on annual survival probabilities of each age class. The program contains files of existing sets of survival or it is possible to enter a new set of data in the table. In most cases, Wild Horse and Burro Specialists do not have data on survival probabilities for their herd populations, so the sample data files provided with WinEquus are used and assume that average survival probabilities in the populations are similar. These data are more difficult to get than is often assumed, because they require keeping track of known individuals over time. A "snapshot" of a population, providing information on the age distribution at a single gather, can NOT be used to estimate survival probabilities without assuming a particular growth rate for the population (Jenkins, 1989). More data from long-term studies of marked horses are needed to develop estimates of survival in various habitats.

Population Data: Foaling Rates

Foaling rates are the proportions of females in each age class that produce a foal at that age. Files are available within the program that set foaling rates or the user may enter a new set of data in the table. The user may also enter the sex ratio at birth, another necessary parameter for population simulation.

Environmental Stochasticity

For any natural population, mortality and reproduction vary from year to year due to unpredictable variation in weather and other environmental factors. This model mimics such environmental stochasticity by using a random process to increase or decrease survival probabilities and foaling rates from average values for each year of a simulation trial. Each trial uses a different sequence of random values to give different results for population growth. Looking at the range of final population sizes in many such trials will give the user an indication of the range of possible outcomes of population growth in an uncertain environment.
How variable are annual survival probabilities and foaling rates for wild horses? The longest study reporting such data was done at Pryor Mountain, Montana by Garrott and Taylor (1990). Based on 11 years of data at this site, survival probability of foals and adults combined was greater than 98% in 6 years, between 90 and 98% in 3 years, 87% in 1 year, and only 49% in 1

year of severe winter weather. These values clearly are not normally distributed, but can be approximated by a logistic distribution. This pattern of low mortality in most years but markedly higher mortality in occasional years of bad weather was also reported by Berger (1986) for a site in northwestern Nevada. Therefore, environmental stochasticity in this model is simulated by drawing random values from logistic distributions. If desired, different values can be entered to change the scaling factors for environmental stochasticity.

Because year-to-year variation in weather is likely to affect foals and adults similarly, this model makes foal and adult survival perfectly correlated. This means that when survival probability of foals is high so is the survival probability of adults, and vice versa. By contrast, the correlation between survival probabilities and foaling rates can be adjusted to any value between -1 and +1. The default correlation is 0 based on the Pryor Mountain data and the assumption that most mortality occurs in winter and winter weather is not highly correlated with foaling-season weather.

The model includes another form of random variation called demographic stochasticity. This means that mortality and reproduction are random processes even in a constant environment (i.e., a foaling rate of 40% means that each female has a 40% chance of having a foal). Because of demographic stochasticity, even if scaling factors for both survival probabilities and foaling rates were set equal to 0, different runs of the simulation would produce different results. However, variation in population growth due to demographic stochasticity will be small except at low population sizes.

Gathering Schedule

There are three choices for the gather schedule: gather at a regular interval, gather at a minimum interval (the default), or gather in specific years. Gathering at a minimum interval means that gathers will be conducted no more frequently than a prescribed interval (e.g., 3 years), but will not be conducted if the time interval has passed unless the population is above a threshold size that triggers a gather.

Gather Interval

This is the number of years between gathers.

Gather for fertility treatment regardless of population size?

If this option is selected (the default), then gathers occur according to the gathering schedule specified regardless of whether or not the population exceeds a threshold population size. One effect of this is that a minimum-interval schedule really functions as a regular interval.

Continue gather after reduction to treat females?

Continuing a gather after a reduction to treat females (with fertility control management options) means that, if a gather for a removal has been triggered because the population has exceeded a threshold population size, then horses will continue to be processed even after enough have been removed to reduce the population to the target population size. As additional horses are

processed, females to be released back will be treated with an immunocontraceptive according to the information specified in the Contraceptive Parameters form.

Threshold for Gather

The threshold population size for triggering a gather is the actual population size in a particular year estimated by the program. This is NOT the same as the number of horses counted in an aerial census, but closer to an estimate of population size taking into account the fact that an aerial census typically underestimates population size.

Target Population Size

This is the goal for the population size following a gather and removal. Horses will be removed until this target is reached, although it may not be possible to achieve this goal, depending on the removal parameters (percentages of each age-sex class to be removed) and gathering efficiency.

Are foals included in AML?

Yes, in the Buckhorn and Coppersmith HMAs, foals are counted as part of the appropriate management level (AML).

Foaling Rates

The foaling rate for a herd is defined as the number of foals divided by the number of mares in the herd that are two years old and older. Research shows that the average age of a filly at puberty is 12 to 15 months, but Russian researchers have reported crossbred trotter mares as reaching puberty at 10 to 11 months (Evans, 1970). The age that a wild filly reaches puberty is dependent on her nutritional level during early life. This means that some fillies can breed as yearlings and give birth as two year olds. The number of fillies giving birth at two years of age affects the foaling rate for the females in a herd.

Gathering Efficiency

Typically, some horses will successfully resist being gathered, either by hiding in habitats where they cannot be seen or moved by a helicopter, or by following escape routes that make it dangerous or un-economical for them to be herded from the air. These horses are not available for removals or fertility treatment. The default gathering efficiency is 80%, meaning that the program assumes that 20% of the population will successfully resist being gathered. This value may be changed.

Note that the program assumes that horses of all age-sex classes are equally likely to be gathered. This is an unrealistic assumption because bachelor males, for example, may be more likely to successfully avoid being gathered than females or foals or band stallions.

Sanctuary-bound Horses

Age-selective removals typically target younger age classes such as 0 to 5 year-olds or 0 to 9 year-olds because these horses are more easily adopted. However, it may not be possible to reduce the population to a target size by restricting removals to these younger age classes, especially if age-selective removals have been conducted in the past. In this case, an option is available to remove older animals as well, who may be destined for permanent residence in a long term holding facility rather than for adoption. The minimum age of these long term holding facility horses is specified for this element. When older age classes as well as younger age classes are identified for removal on the Removal Parameters form, horses of these older age classes are selected along with younger age class horses as the population is reduced to the target value. If a minimum age for long term holding facility horses is specified, then older animals are only removed if the population cannot be reduced to the target population size by removing the younger ones.

Percent Effectiveness of Fertility Control

These percentages represent the percentage of treated females that are in fact sterile for one year, two years, etc. (i.e., the efficacy or effectiveness of fertility treatment). The default values are 90% efficacy for one year. However, the user may specify the effectiveness year by year for up to five years.

Removal Parameters

This allows the user to determine the percentages of horses in each sex and age class to be removed during a gather. The program uses these percentages to determine the probabilities of removing each horse that is processed during a gather. If the percentage for an age-sex class is 100%, then all horses of that age-sex class that are processed will be removed until the target population size is reached. If the percentage for an age-sex class is 0%, then all horses of that age-sex class will be released. If the percentage for an age-sex class is greater than 0% but less than 100%, then the proportion of horses of that age-sex class removed will be approximately equal to the specified percentage.

Contraception Parameters

This allows the user to specify the percentage of released females of each age class that will be treated with an immuno-contraceptive. The default values are 100% of each age class, but any or all of these may be changed.

Most Typical Trial

This is the trial that is most similar to each of the other trials in a simulation.

Population Size Table

The default is both sexes and all age classes, but summary results may also be chosen for a subset of the population. The table identifies some key numbers such as the lowest minimum in

all trials, the median minimum, and the highest minimum. Thinking about the distribution of minima for example, half of the trials have a minimum less than the median of the minima and half have a minimum greater than the median of the minima. If the user was concerned about applying a management strategy that kept the population above some level because the population might be at risk of losing genetic diversity if it were below this level, then one might look at the 10th percentile of the minima, and argue that there was only a 10% probability that the population would fall below this size in x years, given the assumptions about population data, environmental stochasticity, and management that were used in the simulation.

Gather Table

The default is both sexes and all age classes, but summary results may be for a subset of the population. The table shows key values from the distribution of the minimum total number of horses gathered, removed, and (if one elected to display data for both sexes or just for females) treated with a contraceptive across all trials. This output is probably the most important representation of the results of the program in terms of assessing the effects of your management strategy because it shows not only expected average results but also extreme results that might be possible. For example, only 10% of the trials would have entailed gathering fewer animals than shown in the row of the table labeled "10th percentile", while 10% of the trials would have entailed gathering more than shown in the row labeled "90th percentile". In other words, 80% of the time one could expect to gather a number of horses between these 2 values, given the assumptions about survival probabilities, foaling rates, initial age-sex distribution, and management options made for a particular simulation.

Growth Rate

This table shows the distribution of the average population growth rate. The direct effects of removals are not counted in computing average annual growth rates, although a selective removal may change the average foaling rate or survival rate of individuals in the population (e.g., because the age structure of the population includes a higher percentage of older animals), which may indirectly affect the population growth rate. Fertility control clearly should be reflected in a reduction of population growth rate.

Objectives of Population Modeling

To complete the population modeling for the two HMAs, version 1.40 of the WinEquus program, created April 2, 2002, was utilized. Review of the data output for each of the simulations provided many useful comparisons of the possible outcomes for each Alternative. The developer, Stephen Jenkins, recommends thinking about the range of possible outcomes and not just focusing on one average or typical trial. Some of the questions that need to be answered through the modeling include:

- Do any of the Alternatives “crash” the population?
- What effect does fertility control have on population growth rate?
- What effect do the different Alternatives have on the average population size?

- What effect do the different Alternatives have on the number of horses handled and/or removed from the HMA?

Population Data, Criteria, and Parameters Utilized for Population Modeling

All simulations used the survival probabilities and foaling rates supplied with the WinEquus population model for the Granite Range HMA. Survival and foaling rate data were extracted from, *Wild Horses of the Great Basin*, by J. Berger (1986, University of Chicago Press, Chicago, IL, xxi + 326 pp.). Rates are based on Joel Berger's 6 year study in the Granite Range HMA in northwestern Nevada. Survival probabilities and foaling rates utilized in the population models for each Alternative are as follows:

Table 1. Survival Probabilities and Foaling Rates – All Alternatives

Age Class	Survival Probabilities (%)		Foaling Rates (%)
	Females	Males	
Foals	.917	.917	--
1	.969	.969	--
2	.951	.951	.35
3	.951	.951	.40
4	.951	.951	.65
5	.951	.951	.75
6	.951	.951	.85
7	.951	.951	.90
8	.951	.951	.90
9	.951	.951	.90
10-14	.951	.951	.85
15-19	.951	.951	.70
20+	.951	.951	.70

The removal criteria utilized in the population models for Alternative A is shown in Table 2. This is the formula used in the population modeling program to arrive at a 50/50 (studs to mares) age/sex ratio.

Table 2. Removal Criteria – Alternative A

Age	Percentages for Removals		Age	Percentages for Removals	
	Females	Males		Females	Males
Foal	100%	100%	7	100%	100%
1	100%	100%	8	100%	100%
2	100%	100%	9	100%	100%
3	100%	100%	10-14	100%	100%
4	100%	100%	15-19	100%	100%
5	100%	100%	20+	100%	100%
6	100%	100%			

The removal criteria utilized in the population models for Alternative B is shown in Table 3.

Table 3. Removal Criteria – Alternative B

Age	Percentages for Removals		Age	Percentages for Removals	
	Females	Males		Females	Males
Foal	100%	100%	7	100%	100%
1	100%	100%	8	100%	100%
2	100%	100%	9	100%	100%
3	100%	100%	10-14	100%	100%
4	100%	100%	15-19	100%	100%
5	100%	100%	20+	100%	100%
6	100%	100%			

Population Modeling Criteria

The following summarizes the population modeling criteria that are common to all of the Alternatives for all of the HMAs (as applicable):

- Starting Year: 2012
- Sex ratio at birth: 50% male, 50% female
- Foals are included in the AML
- Simulations were run for ten years with 100 trials each
- Initial gather year: 2012
- Gather interval: minimum interval of three years
- For Alternatives A and B the gathers to be triggered by the population reaching maximum AML (85 head for the Buckhorn HMA, and 75 head for the Coppersmith HMA).
- Percent of the population that can be gathered: 95%
- For Alternatives A and B, the target population size following gathers is the minimum AML (59 head for the Buckhorn HMA, and 50 head for the Coppersmith HMA).
- Target may not be reached at each gather, depending upon the Alternative.
- For Alternatives A and C, fertility control effectiveness for treated mares is assumed to be 80% the first year, 65% the second year, and 50% the third year after treatment.
- For Alternative A, the HMAs would not be gathered for fertility control regardless of population size, but only when the population exceeds the high end of the AML. Ongoing gathers would continue after population goals are met to secure additional mares for fertility treatment.
- For Alternative C, the HMA would be gathered for fertility control regardless of population size.

Population Modeling Results of the Buckhorn HMA

Population Size in Ten Years

Out of 100 trials in each simulation, the model tabulated minimum, average, and maximum population sizes. The model was run for ten years to determine what the potential effects would be on population size for all Alternatives (A - D). These numbers are useful to make relative comparisons of the different Alternatives and of the potential outcomes under different management options. The data displayed within the tables are broken down into different levels. The lowest trial, highest trial, and several percentile trials are displayed for each simulation completed. According to the model developer, this output is probably the most important representation of the results in terms of assessing the effects of proposed management. The trials show not only the expected average results, but also extreme high and low results of the modeling scenario.

The initial age structure for the 2012 Buckhorn herd was developed by entering the estimated population size into the WinEquus system and allowing the model to computer generate estimates.

Table 4. Age Structure of Wild Horses in the Buckhorn HMA, 2012

Age Class	Females (No.)	Males (No.)	Total (No.)
Foals	0	0	0
1	0	0	0
2	0	0	0
3	0	2	2
4	0	0	0
5	0	1	1
6	3	5	8
7	3	5	8
8	6	7	13
9	13	13	26
10-14	37	36	73
15-19	18	15	33
20+	5	3	8
Total	**85**	**87**	**172**

Table 5. Predicted Population Sizes in 10 years – Buckhorn HMA

Trial	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	Population Size (No.)			Population Size (No.)			Population Size (No.)			Population Size (No.)		
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Lowest	**39**	66	173	**30**	79	173	**155**	228	304	**164**	350	603
10%	52	82	176	55	87	177	178	292	408	176	394	674
25%	57	86	180	60	92	180	182	311	461	182	419	772
Median	**61**	**89**	**188**	**64**	**99**	**188**	**187**	**356**	**554**	**189**	**467**	**844**
75%	65	93	198	68	101	195	**198**	393	638	**200**	517	947
90%	69	96	212	70	104	204	215	444	746	222	566	1102
Highest	75	103	**244**	75	112	**233**	248	558	**1014**	289	701	**1348**
Gather years	2012, 2016			2012, 2016, 2020			2012, 2016, 2020, 2024			NA		

Table 6. Average Growth Rate Percentage in 10 Years – Buckhorn HMA

Trial	Alternative A. Proposed Action	Alternative B. Removal Only	Alternative C. Fertility Control Only	Alternative D. No Action
	Growth Rate (%)	Growth Rate (%)	Growth Rate (%)	Growth Rate (%)
Lowest	0.2	5.4	4.8	9.9
10%	5.8	10.6	8.0	13.4
25%	7.2	13.6	9.5	14.5
Median	**9.7**	**16.9**	**11.2**	**16.2**
75%	11.8	18.5	12.9	17.3
90%	12.9	19.9	13.8	18.9
Highest	15.9	24.0	15.5	20.2

Table 7. Historic Reproductive Rates – Buckhorn HMA

Inventory Date	Adult (No.)	Foal (No.)	Rate (%)
1993	123	22	17.9
1995	149	27	18.1
1997	108	17	15.7
2001	132	30	22.7
2005	199	40	20.1
2009	215	32	14.9
2010	107	22	20.6

Table 8. Number of Horses Gathered (G), Removed (R), and Treated (T) in 10 years – Buckhorn HMA

Trial	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	G	R	T	G	R	T	G	R	T	G	R	T
Lowest	123	47	4	116	83	0	517	0	101	0	0	0
10%	198	80	9	156	118	0	658	0	132	0	0	0
25%	210	88	12	176	134	0	687	0	144	0	0	0
Median	**234**	**107**	**14**	**196**	**149**	**0**	**791**	**0**	**170**	**0**	**0**	**0**
75%	280	122	20	214	168	0	868	0	182	0	0	0
90%	300	136	26	226	178	0	944	0	205	0	0	0
Highest	322	153	34	260	206	0	1212	0	285	0	0	0

Buckhorn HMA – Population Modeling Summary

To summarize the results obtained by simulating the range of Alternatives for the Buckhorn HMA wild horse gather, the original questions can be addressed.

- Do any of the Alternatives "crash" the population?

Neither of the Action Alternatives A or B indicate that a crash is likely to occur in the Buckhorn HMA population. The minimum population level for Alternative A was 39 horses in the HMA under the extreme lowest trial. Alternative A showed an 80% chance that the minimum population will range from 52 horses to 69 horses. The minimum population level for Alternative B was 30 horses in the HMA under the extreme lowest trial. Alternative B showed an 80% chance that the minimum population will range from 55 to 70 horses. Median growth rates are all within reasonable levels, and adverse impacts to the population are not likely.

The No Action Alternative D, and the Action Alternative C, could result in a crash. If no horses are removed from the HMA, the maximum population for Alternative D would have an 80% chance of ranging from 674 head to 1,102 head, and the maximum population for Alternative C would have an 80% chance of ranging from 408 head to 746 head by 2022. Before that time, horses would be causing serious impacts on soil stability, riparian vegetation, water sources (springs and creeks), wildlife habitat, cultural resources, and livestock operations. Horses would begin running short of forage and water, and would be in poor shape going into winter. At some point the population would crash, probably during an unusually cold or snowy winter.

- What effect does fertility control have on population growth rate?

The Proposed Action (Alternative A) and the alternative implementing fertility control only (Alternative C) reflect the lowest overall growth rates. The growth rate for Alternative A showed an 80% chance of ranging from 5.8% to 12.9%, and Alternative C showed an 80% chance of ranging from 8.0% to 13.8%, as compared to Alternative B which showed an 80% chance of ranging from 10.6% to 19.9%, and the No Action Alternative D which showed an 80% chance of ranging from 13.4% to 18.9%. The highest median growth rate occurred under

Alternative B which showed a median of 16.9%, and Alternative D with a median of 16.2%. Alternative C resulted in a median growth rate of 11.2% and Alternative A resulted in a median of 9.7%.

- What effect do the different Alternatives have on the median population size?

Implementation of Alternative A or B would result in stable median population numbers that are close to AML's over the long term. The impacts of these two Alternatives on long term populations are similar. Implementation of Alternative C or Alternative D would result in population sizes with forage consumption levels that would eventually exceed the total forage production of the HMA.

- What effect do the different Alternatives have on the number of horses handled and/or removed from the HMA's?

Implementation of the No Action Alternative D would result in the fewest numbers of horses being handled or removed. Under this Alternative no horses would be gathered, removed, or treated for fertility control.

Implementation of Alternative C would also result in the fewest number of horses being removed, as no horses would be removed. Implementation of Alternatives A would result with an 80% chance of 80 to 136 head being removed vs. Alternative B, with an 80% chance of 118 to 178 head being removed. In addition, Alternative A would require two gathers over the next 10 years to meet and maintain AML, vs. the three gathers needed under Alternative B. Under Alternative C, there would be four gathers needed, and the AML would not be reached.

Implementation of Alternative B would result in the fewest number of horses being handled with an 80% chance of 156 to 226 horses being gathered. Alternative A would result in an 80% chance of 198 to 300 horses being handled, and Alternative C would result in an 80% chance of 658 to 944 horses being handled. This is due to extra horses being gathered for the purpose of treating mares with fertility control and releasing them back into the HMA.

Population Modeling Results of the Coppersmith HMA

The initial age structure for the 2012 Coppersmith herd was developed by entering the estimated population size into the WinEquus system and allowing the model to computer generate estimates, as shown in Table 9.

Table 9. Age Structure of Wild Horses in the Coppersmith HMA, 2012

Age Class	Females (No.)	Males (No.)	Total (No.)
Foals	0	0	0
1	0	0	0
2	0	0	0
3	0	1	1
4	0	0	0
5	0	1	1
6	1	2	3
7	1	2	3
8	2	3	5
9	7	6	13
10-14	14	15	29
15-19	9	7	16
20+	2	2	4
Total	**36**	**39**	**75**

Table 10. Predicted Population Sizes in 10 years – Coppersmith HMA

Trial	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Lowest	**35**	59	76	**27**	58	79	**61**	89	108	**48**	69	94
10%	43	63	81	46	68	88	76	115	164	76	148	223
25%	48	65	83	50	71	94	78	132	196	78	174	300
Median	**52**	**68**	**88**	**52**	**73**	**104**	**81**	**158**	**235**	**80**	**201**	**358**
75%	56	71	**93**	54	77	114	85	173	284	85	224	403
90%	59	73	101	57	81	124	90	197	337	89	251	462
Highest	64	77	**121**	60	87	**148**	101	239	**437**	119	289	**606**
Gather years	2012, 2016			2012, 2016, 2020			2012, 2016, 2020, 2024			NA		

Table 11. Average Growth Rate Percentage in 10 years – Coppersmith HMA

Trial	Alternative A. Proposed Action	Alternative B. Removal Only	Alternative C. Fertility Control Only	Alternative D. No Action
Lowest	3.3	3.5	1.5	1.4
10%	6.8	10.8	6.5	10.2
25%	8.3	12.8	8.8	13.6
Median	**10.4**	**15.0**	**11.1**	**15.8**
75%	12.6	17.6	13.1	17.4
90%	13.5	19.2	15.0	18.9
Highest	17.7	23.5	18.0	23.1

Table 12. Historic Reproductive Rates – Coppersmith HMA

Inventory Date	Adult (No.)	Foal (No.)	Rate (%)
1995	120	17	14.2
1997	85	16	18.8
2001	78	14	17.9
2010	51	2	3.9

Table 13. Number of Horses Gathered (G), Removed (R), and Treated (T) in 10 years – Coppersmith HMA

Trial	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	G	R	T	G	R	T	G	R	T	G	R	T
Lowest	56	15	6	49	35	0	198	0	41	0	0	0
10%	124	40	13	80	66	0	262	0	54	0	0	0
25%	138	52	16	90	77	0	298	0	62	0	0	0
Median	**196**	**65**	**21**	**102**	**88**	**0**	**348**	**0**	**72**	**0**	**0**	**0**
75%	208	76	24	118	102	0	384	0	84	0	0	0
90%	217	86	28	136	117	0	447	0	96	0	0	0
Highest	235	100	33	165	144	0	532	0	128	0	0	0

Coppersmith HMA – Population Modeling Summary

To summarize the results obtained by simulating the range of Alternatives for the Coppersmith HMA wild horse gather, the original questions can be addressed.

- Do any of the Alternatives "crash" the population?

  Neither of the Action Alternatives A or B indicate that a crash is likely to occur in the Coppersmith HMA population. The minimum population level for Alternative A was 35 horses in the HMA under the extreme lowest trial. Alternative A showed an 80% chance that the median population will range from 63 head to 73 head. The minimum population level for

Alternative B was 27 horses in the HMA under the extreme lowest trial. Alternative B showed an 80% chance that the median population will range from 68 to 81 head. Median growth rates are all within reasonable levels, and adverse impacts to the population are not likely.

The No Action Alternative D and Alternative C could result in a crash. If no horses are removed from the HMAs, the maximum population for Alternative D would have an 80% chance of ranging from 223 head to 462 head, and the maximum population for Alternative C would have an 80% chance of ranging from 164 head to 337 head by 2022. Before that time, horses would be causing serious impacts on soil stability, riparian vegetation, water sources (springs and creeks), wildlife habitat, and livestock operations. Horses would begin running short of forage and water, and would be in poor shape going into winter. At some point the population would crash, probably during an unusually cold or snowy winter.

- What effect does fertility control have on population growth rate?

The alternative implementing fertility control (Alternative A), and the alternative implementing fertility control only (Alternative C) reflect the lowest overall growth rates. The growth rate for Alternative A showed an 80% chance of ranging from 6.8% to 13.5%, and Alternative C showed an 80% chance of ranging from 6.5% to 15.0%, as compared to Alternative B which showed an 80% chance of ranging from 10.8% to 19.2%, and the No Action Alternative D which showed an 80% chance of ranging from 10.2% to 18.9%. The highest median growth rate occurred under Alternative D which showed a median of 15.8%, compared to Alternative B with a median of 15.0%, Alternative A with a median of 10.4%, and Alternative C with a median of 11.1%.

- What effect do the different Alternatives have on the median population size?

Implementation of Alternative A or B would result in stable median population numbers that are close to AMLs over the long term. The impacts of these two Alternatives on long term populations are similar. Implementation of Alternative D or Alternative C would result in population sizes with forage consumption levels that would eventually exceed the total forage production of the HMAs.

- What effect do the different Alternatives have on the number of horses handled and/or removed from the HMAs?

Implementation of the No Action Alternative D would result in the fewest numbers of horses being handled or removed. Under this Alternative no horses would be gathered, removed, or treated for fertility control. Implementation of Alternative C would also result in the fewest number of horses being removed, as no horses would be removed. Implementation of Alternative A would result with an 80% chance of 40 to 86 head being removed vs. Alternative B, with an 80% chance of 66 to 117 head being removed. In addition, Alternative A would require two gathers over the next 10 years to meet and maintain AML, vs. the three gathers needed under Alternative B. Under Alternative C, there would be four gathers needed, and the AML would not be reached. Implementation of Alternative B would result in

the fewest number of horses being handled with an 80% chance of 80 to 136 horses vs. Alternative A with an 80% chance of 124 to 217 horses being handled. Alternative C would result in an 80% chance of 262 to 447 horses being handled due to extra horses being gathered for the purpose of treating mares with fertility control and releasing them back into the HMAs.

Results - Population Modeling of the Buckhorn and Coppersmith HMAs

The following tables list the combined population predictions from the two HMAs, as described above. Table 14 below lists the median values for the predicted population size for each HMA under the four alternatives.

Table 14. Predicted Population Sizes in 10 years – Buckhorn and Coppersmith HMAs

HMA	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	Median Population Size (No.) [1/]											
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Buckhorn	61	89	188	64	99	188	187	356	554	189	467	844
Coppersmith	52	68	88	52	73	104	81	158	235	80	201	358
Total	**113**	**157**	**276**	**116**	**172**	**292**	**268**	**514**	**789**	**269**	**668**	**1202**

[1/] These numbers are derived from the median values listed for each HMA in Table 5 and Table 10 of *Appendix C. Summary of Population Modeling of Wild Horses in the Buckhorn and Coppersmith HMAs.*

Table 15. Average Growth Rate in 10 Years – Buckhorn and Coppersmith HMAs

HMA	Alternative A. Proposed Action	Alternative B. Removal Only	Alternative C. Fertility Control Only	Alternative D. No Action
	Median Growth Rate (%)[1/]			
Buckhorn	9.7	16.9	11.2	16.2
Coppersmith	10.4	15.0	11.1	15.8
Range	9.7 – 10.4	15.0 – 16.9	11.1 – 11.2	15.8 – 16.2
Average	**10.0**	**16.0**	**11.2**	**16.0**

[1/] These numbers are derived from the median values listed for each HMA in Table 6 and Table 11 of *Appendix C. Summary of Population Modeling of Wild Horses in the Buckhorn and Coppersmith HMAs.*

Table 16. Number of horses Gathered (G), Removed (R), and Treated (T) in 10 Years – Buckhorn and Coppersmith HMAs

Trial	Alternative A. Proposed Action			Alternative B. Removal Only			Alternative C. Fertility Control Only			Alternative D. No Action		
	Median Number of Horses [1/]											
	G	R	T	G	R	T	G	R	T	G	R	T
Buckhorn	234	107	14	196	149	0	791	0	170	0	0	0
Coppersmith	196	65	21	102	88	0	348	0	72	0	0	0
Total	**430**	**172**	**35**	**298**	**237**	**0**	**1139**	**0**	**242**	**0**	**0**	**0**

[1/] These numbers are derived from the median values listed for each HMA in Table 8 and Table 13of *Appendix C. Summary of Population Modeling of Wild Horses in the Buckhorn and Coppersmith HMAs.*